

LEVELS OF REPRESENTATION
AND
ARGUMENT STRUCTURE IN TURKISH

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Thesis submitted to the University of London
in partial fulfilment of the requirements for the degree of
Doctor of Philosophy

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1993

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ABSTRACT

This is a study of the argument structure of complex predicates in Turkish. The central hypothesis is that grammatical function changing phenomena such as morphological causativisation, passivisation and reflexivisation exhibit the interaction of processes of grammar and general reasoning. The work aims at explaining the properties of these constructions in the newly emerging framework of Labelled Deductive Systems (Gabbay 1990, Gabbay and Kempson 1992a,b), a model which articulates grammar as a natural deductive system.

Part I provides the theoretical background for the analysis of complex predicates. The first chapter introduces the issues surrounding the representation of complex predicates and argues against a particular multi-stratal approach, syntactic incorporation. In the second chapter complex predicates are investigated within Licensing Grammar, a two-level syntactic model. It is argued that although this model accounts for certain asymmetries by virtue of characterising syntax and logic separately, its commitment to a static understanding of logic undermines its explanatory capacity. The third chapter lays out the properties of the model which is used in the remainder of the dissertation. The framework of LDS characterises linguistic phenomena as a process whereby instructions provided by lexical specifications dynamically interact, and syntactic structures unfold as these specifications are implemented.

Part II is an analysis of causativisation, passivisation and reflexivisation in Turkish. It is argued that causativisation involves an altogether different mechanism from passivisation and reflexivisation. The causative affix in Turkish has declarative content and behaves like a predicate, whereas passivisation and reflexivisation are instructions operating on the argument structure of verbs. Chapter IV focuses on causativisation. It is shown that LDS, with its procedural apparatus, captures the problems surrounding the clausal nature of causativisation quite naturally. It is also argued that case marking in causative constructions, a previously problematic issue,

receives a straightforward explanation once case marking is taken to give instructions for structure building in the combinatorial process.

In Chapter V I propose a unitary account for passives and reflexives in Turkish. I suggest that both involve argument absorption defined through a notion of logical dependency, the difference between them being stated in terms of the argument to be absorbed. The interaction of these processes with case marking is analysed and the analysis of case marking is shown to make correct predictions.

In Chapter VI the proposed analysis is extended to combinations of causatives, passives and reflexives and their interaction with case marking. We see that separating causativisation as a process which is radically distinct from the other two is justified and that the proposed properties of case marking are verified. Some sequences which remain problematic for all analyses are also discussed.

The final chapter discusses the status of certain concepts and principles of Universal Grammar (the Projection Principle, Theta Theory, Case Theory, the Mirror Principle) in the light of the newly emerging model of LDS. With respect to configurationality, I argue that hierarchy and linearity need to be characterised separately, a possibility which is available in the framework of LDS.

ACKNOWLEDGEMENTS

The theoretical framework that this thesis is based on is developed by Ruth Kempson whom I was fortunate enough to have as supervisor. I started working with her at a time when she was beginning to formulate her ideas about natural language, and this thesis therefore reflects the turns in her thinking as well as mine. As a result, she has directly contributed to the development of many ideas discussed in this work. Although it took me many years to complete this thesis, I consider myself lucky to have been in a position where fundamental questions about language were thrown at me with the belief that I might have an answer. My intellectual development as a linguist owes a lot to Ruth Kempson's rare quality of combining high standards and rigour with enthusiasm and productivity. Working with her is an experience I will never forget.

The earlier part of the thesis was made possible through a British Council grant. The development of many of the ideas proposed were influenced by discussions held with a number of people and their comments on earlier and recent versions of the manuscript, in particular Margaret Bainbridge, Hagit Borer, Wynn Chao, Monik Charette and Jaklin Kornfilt. I have also benefited greatly from the comments made by the audiences at the LAGB meetings in Exeter, York and Guildford, at the Turkish Linguistics Conferences in Tilburg, Ankara and London and at the Conference on Greek Linguistics in Thessaloniki. Many of the ideas are the direct outcome of the comments in those meetings.

I would like to mention here the contribution of the syntax workshop held by Wynn Chao at SOAS and the lectures jointly given by Dov Gabbay and Ruth Kempson at Imperial College. Issues discussed in these seminars helped me formulate my ideas on many aspects of syntax and semantics. Thanks are also due to Monik Charette for giving me the opportunity to present some of my ideas in her seminars on The Structure of Mongolian. I would like to thank fellow students from SOAS and UCL, in particular Julia Capritsa, Abderrahim Jamari, Yan Jiang, Reiko Itani, Sozinho Matsinhe,

Mohammed Munkaile, Jamal Ouhalla, Elizabeth Parker, Andrew Simpson, Xiao Fu Yu, Stavroula Tsiplaki, Anna Pettiward, Baye Yimam for creating a friendly environment in which linguistics was discussed. I am also indebted to Thea Bynon and Jonathan Kaye for giving me encouragement and support during my studentship at SOAS.

With respect to the data used in this work I thank Mr. Chuloonbaatar, Raymond Ndalindwa, and Yuko Yoshida for spending valuable time with me on Mongolian, Kinyarwanda and Japanese, respectively. For sharing their intuitions on Turkish with me, I would like to thank the following: Metin Başoglu, Ayşe Bircan, Barış Pirhasan, Hale Soygazi, İlhan Tekin and Mehmet Yaşın. Kate Fleet very patiently answered some of my queries on English, sometimes against her better judgement. I am grateful to Georgia Catsimali and Julia Capritsa for long hours of discussion on linguistics and for their friendship and encouragement. Anna Pettiward deserves thanks for proofreading the manuscript. Special thanks go to Metin for tolerating my anxiety when he had enough to cope with already. None of the above are to be held responsible for the outcome in any way; all errors and misrepresentations are mine, unfortunately.

Members of my family have supported me in many ways throughout the years. They each know their contribution, I hope, and I cannot thank them enough for all they have done.

Finally, I would like to acknowledge my gratitude to my children Emine and Yusuf who allowed me the time and silence I required, without always understanding why my work was so important. They learnt at a very early age that mothers, too, are capable of being very selfish, just like anyone else. And I learnt even more from them.

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ABBREVIATIONS

The following abbreviations are used in this work:

ABL: ablative
ABS: absolutive
ACC: accusative
AGR: agreement
AOR: aorist
ASP: aspect
CAUS: causative
COND: conditional
DAT: dative
DUR: durative
ERG: ergative
FEM: feminine
GEN: genitive
GER: grundive
HS: hearsay particle
INFL: inflection
INFN: infinitive
INT: intransitive
INTER: interrogative
IRR: irrealis
INS: instrumental
LOC: locative
MAS: masculine
MID: middle
MOD: modal
NC: nominal compound marker
NEG: negation
NOM: nominative
O: object
OM: object marker
OBL: oblique
PL: plural
PASS: passive
PERF: perfective
PN: proper noun marker
POSS: possessive
PRES: present tense
PROG: progressive
REC: reciprocal

REF: reflexive
s: singular
S: subject
SM: subject marker
SP: subject agreement prefix
TNS: tense
TOP: topic
TR: transitivity marker
VER: verbalising affix
1: first person
2: second "
3: third "

PART I

THEORETICAL ASSUMPTIONS

CHAPTER I

COMPLEX PREDICATES: THEIR STATUS IN THE THEORY OF GRAMMAR

1.1 Introduction

The analysis of complex predicates involves two issues crucial to the organisation of grammar: the nature of word formation and the nature of processes that affect the argument structure of predicates and clauses containing them. Problems relating to word formation concern a putative morphological component of a grammar, and problems relating to clause structure concern the syntactic component. In the case of predicates which contain affixes that alter argument structure, the two issues become interrelated. In this thesis I take issue with one standard (Government and Binding) analysis of the phenomenon and argue instead that complex predicates provide evidence for a quite different conception of syntax, in which syntax is seen as founded directly in logic. In investigating this possibility I consider two alternatives. First I consider a framework in which syntactic structure is seen as partly reducible to logical structure. Then I turn to a framework in which the static conception of logical form is replaced by a dynamic process of structure building. The structure of the thesis reflects these three theoretical approaches, laid out in Part I. Chapter I is the evaluation of the Government and Binding analysis, in particular the Incorporation analysis of Baker (1988). Chapter II is an account of Licensing Grammar which is set up to allow interaction between syntactic constraints and pragmatic processing (Kempson 1990). Chapter III is an account of the new developing framework of Gabbay and Kempson in which syntactic analysis is articulated in terms of natural-deduction proof structure. Part II of the thesis goes on to reconsider complex predicates in Turkish in the light of the new model. Chapter IV is an analysis of causativisation, Chapter V investigates the processes of passivisation and reflexivisation, and Chapter VI looks at the combination of these processes. Finally I look briefly at certain principles and modules of the Government and Binding framework and discuss their status within the present model.

For the purposes of this study, I will take a complex predicate to be a verbal complex composed of a verbal stem, which will henceforth be referred to as the root verb, and a grammatical function changing affix. A grammatical function changing affix encodes mechanisms that alter the syntactic relationship between an argument and a predicate without altering the thematic relationship between them. In the following examples, the underlined arguments in sentences (a) and (b) have identical thematic relations with the verb, but distinct syntactic relations:

Causative

- (1) a. Sema koş-tu.
run-PAST
Sema ran. (*Sema* = subject)
- b. Zeyda Sema-yı koş-tur-du.
-ACC run-CAUS-PAST
Zeyda made Sema run. (*Sema* = object)

Passive

- (2) a. Sema duvar-ı yık-tı.
wall-ACC demolish-PAST
Sema demolished the wall. (*duvar* = object)
- b. Duvar yık-ıl-dı.
wall demolish-PASS-PAST
The wall was demolished. (*duvar* = subject)

Reflexive

- (3) a. Sema kendisi-ni yıka-dı.
self-ACC wash-PAST
Sema washed herself. (*kendisi* (i.e. content of Sema) = object)

- b. Sema yıka-n-dı.
wash-REF-PAST

Sema washed (herself). (*Sema* = subject only)

Reciprocal

- (4) a. Zeyda Sema-yı, Sema Zeyda-yıöp-tü.
-ACC -ACC kiss-PAST

Zeyda kissed Sema and Sema kissed Zeyda. (*Sema*, *Zeyda* = subjects and objects)

- b. Zeyda ile Semaöp-üs-tü.
and kiss-REC-PAST

Zeyda and Sema kissed (each other). (*Sema*, *Zeyda* = subjects)

The main emphasis in this work will be on the first three types of complex predicates. The reciprocal will only be referred to when it interacts with other grammatical function changing affixes. Other complex predicates, such as those formed by the combination of a verbal stem with a modal or those that are formed by the combination of a nominal/adjectival stem with a verbal suffix will be excluded from this study since they do not alter grammatical relations.

The remainder of this introductory section will provide general information about the structure of Turkish and the structure of complex predicates. In section 1.11 I will give a general exposition of the structure of Turkish to provide a backdrop for the discussions in the ensuing chapters. Where I have to make specific points, I will exemplify by causatives since the issues raised in the remainder of this chapter focus on causativity and its representation. Section 1.12 will consist of an outline of analyses concerning the status of complex predicates in morphology and in syntax.

In an effort to understand the function and nature of levels of syntactic representation, I will discuss some problems with an analysis that subsumes morphology under the syntactic component immediately after the introductory section. I will come to the conclusion that insofar as the representation of complex predicates is concerned, a grammatical model with a monostratal syntax is preferable.

1.11 The structure of Turkish

In this section I will provide a brief description of some morphological and syntactic properties of Turkish which will be relevant to the elaboration of specific points later on. The exposition will be limited to the description of the relevant data. The morphological and syntactic descriptions will be provided in separate subsections below.

1.111 Morphology

Turkish is a highly agglutinative language where affixation is realised exclusively by means of suffixation with the exception of reduplicative affixes occurring as prefixes, and several loan prefixes.

Two aspects of Turkish morphology deserve special attention. One is the effect of phonological factors such as vowel harmony and consonant assimilation. Vowel harmony in Turkish has the effect of inducing vocalic alternation in an affix and within stems in accordance with the properties of the vowel in the preceding morpheme. If an affix is specified in the lexicon as containing /a/, it can surface either as /a/ or /e/ depending on the quality of the preceding vowel. If, on the other hand, an affix is specified as having /i/, the alternation is between /i/, /ɯ/, /ü/ and /u/. To give an example, the locative suffix *-de* surfaces as such when attached to a word like *ev* 'house', hence *ev-de* 'in the house'. When it is attached to a word like *ova* 'plain' it surfaces as *-da*, hence *ova-da* 'in the plain'. The causative suffix *-dir*, by contrast, contains /i/ in its lexical representation, hence surfacing as *-dir*, *-dır*, *-dür*, *-dur*. Consonant assimilation is also a factor that affects the phonetic quality of a suffix, and

affixes with a certain initial consonant that can alternate between a voiced and voiceless counterpart undergo this process. The affixes just mentioned have an initial /d/, for which the language has a voiceless counterpart /t/. Putting all these factors together, the locative suffix has the forms *-de*, *-da*, *-te*, *-ta*, and the causative suffix has the forms *-dir*, *-dır*, *-dür*, *-dur*, *-tir*, *-tır*, *-tür*, *-tur*.¹

The other point that needs to be mentioned with respect to Turkish morphology is the order of suffixes. Suffixes that belong to the inflectional system (in the case of the verbal paradigm person, tense, aspect, number) always follow grammatical function changing affixes. Although the order among inflectional suffixes is slightly flexible (Göksel 1986, Bainbridge 1988) grammatical function changing affixes are rigidly fixed. Of all the possible permutations of the four grammatical function changing suffixes cooccurring, only the following are grammatical:

- (5) V-REC-CAUS-PASS
- V-REC-CAUS
- V-REC-PASS
- V-CAUS-PASS
- V-CAUS-CAUS
- V-REF-PASS
- V-PASS-PASS

Each sequence in (5) directly reflects the order in which the morphemes are semantically composed. In other words, the semantic and morpho-phonological concatenation of these suffixes take place in a parallel fashion.² As noted above, their order is also fixed with respect to inflectional suffixes which always have to follow them. Resorting tentatively to the traditional term "derivational morpheme" to denote grammatical function changing affixes, we can indicate their order within a Turkish word as follows:

- (6) a. Verb + derivational morphemes + inflectional morphemes
 b. *Verb + inflectional morphemes + derivational morphemes

Notice that the rigidity of this order in Turkish overrides other factors such as those relating to semantic considerations. To give an example, the negative suffix, which also has a fixed position, cannot select the morphological slot most suitable for its scope properties, but has to occur adjacent to the last grammatical function changing affix.³ A more detailed evaluation of issues relating to the scope of negation will be provided in section 1.215.

The rigidity of affix ordering breaks down somewhat within the inflectional paradigm. Although there are certain restrictions on their order, inflectional affixes can occur in different positions in relation to one another, sometimes with effects that alter interpretation (as in (7a) and (7b) where affix order signals the distinction between non-factive and factive conditionals, respectively), but in other cases with no interpretive effect (as in (8a) and (8b)):

- (7) a. Gel-se-(y)di-n...
 come-COND-PAST-2
 If you had come...

- b. Gel-di-(y)se-n...
 come-PAST-COND-2
 If you have come...

- (8) a. Gel-miş-ler-di.
 come-HS-PL-PAST
 They had come.

- b. Gel-miş-ti-ler.
 come-HS-PAST-PL
 They had come.

There are also cases where the position of the agreement marker changes in interrogatives depending on the aspectual marker that is present:

- (9) a. Gel-iyor mu-sun? (*Gel-iyor-sun mu?)
 come-PROG INTER-2
 Are you coming?
- b. Gel-di-n mi? (*Gel-di mi-n?)
 come-PERF-2 INTER
 Have you come?

A property of the agreement marker that should be mentioned is the null member of the set, the third person singular. Third person plural is also sometimes marked by the absence of overt marking, subject to distance restrictions. Although there is much more to be said about the order of inflectional morphemes and certain peculiarities they display, these are not relevant to the present work.

1.112 Syntax

The order of major constituents in Turkish clauses is free when there is overt case marking on the N(oun) P(hrase)s, or sentential complements. The position of sentential adverbs is also free. Hence, there is no distinction in terms of structural well-formedness between the sentences in (10), which are a few of the one hundred and twenty possible permutations, although their frequency in everyday conversation would vary:

- (10) a. Babam çocuklar-a para-yı dün ver-di .
 my father-NOM children-DAT money-ACC yesterday give-PAST
 My father gave the money to the children.
- b. Çocuklar-a para-yı babam ver-di dün.
 IO DO S V ADV
- c. Ver-di para-yı dün çocuklar-a babam.
 V DO ADV IO S
- d. Dün para-yı babam ver-di çocuklar-a.
 ADV DO S V IO

The variations in constituent order reflect differences in focused and topicalised elements, and elements which are used as afterthought.⁴ Free scrambling of major constituents is restricted when case marking can no longer be used as a means of identifying grammatical relations. In the absence of overt case marking, or in sentences where the same case marker occurs twice, word order is used as a means of signalling grammatical relations, and the flexibility of word order no longer prevails. An example of the first kind, absence of overt (accusative) case marking, takes place when direct objects do not carry their identifying accusative case marker. These are the cases where these NPs are non-specific. In such cases the direct object must immediately precede the predicate:

- (11) a. Kedi kuş ye-me-z.
 cat bird eat-NEG-AOR
 Cats don't eat birds.

- b. Kuş kedi ye-me-z.
 bird cat eat-NEG-AOR
 Birds don't eat cats.

Restricting word order is a means also for disambiguating constructions with the double occurrence of a case marker. E(xceptional) C(ase) M(arking) constructions as in (12a) have two accusative marked NPs, and causatives of transitive verbs as in (12b) also have two dative marked elements:

- (12) a. Ben sen-i ben-i sev-iyor san-ıyor-du-m.
 I you-ACC I-ACC like-ASP think-ASP-TNS-AGR
 I thought you liked me.
- b. Babam-a çocuklar-a masal anlat-tır-dı-m.
 my father-DAT children-DAT story tell-CAUS-PAST-1
 I had my father tell a story to the children.

In the spoken language, sentences like (12a) pose no problem as the intonation pattern of such utterances force a unique interpretation irrespective of the order of the (accusative marked) elements. It is only in the written language that linear order distinguishes between different grammatical relations such that the NP immediately preceding the verb is the only one to be interpreted as the direct object. In (12b), which some speakers marginally accept, the dative is the marker of two separate functions: it marks the subject of the root verb and it marks the goal. This dual function forces the grammar to provide additional means for disambiguation, and as in non-overtly case marked languages, the role of arguments in relation to the verb is signalled by word order. The effect of this in (12b) is that the goal has to be closer to the verbal complex than the subject of the root verb. Details of such constructions will be taken up in Chapter IV, particularly in sections 4.32 and 4.41, respectively.

Sentences of the kind provided in (10) above indicate that the canonical word order in Turkish is OV. The subject of a sentence does not have to be overtly expressed, a property which is loosely correlated with the richness of morphological case marking. The case system of Turkish distinguishes between seven case markers: nominative (unmarked), accusative *-(y)i*, dative *-(y)e*, ablative *(-den)*, locative *(-de)*, instrumental *-(y)le*, genitive *-(n)in*, the bracketed phonemes standing for "buffers" required by stems ending in vowels. Of these, the genitive marks the relation between two nouns, while the other cases mark the relation between an NP and a predicate. The function of case marking in Turkish is non-unitary: certain cases are used to indicate structural relations between a predicate and its arguments, and others mark adverbial phrases. I shall primarily be interested in the first group, and in section 4.32 I shall provide an analysis for case markers which mark arguments. Adverbials may also be formed by postpositions, of which Turkish has only a few. I shall be looking at just one of these, *tarafından* 'by', a complex word denoting agentive phrases in section 5.323.

1.12 Complex predicates

1.121 Complex predicates as complex words

Although our main concern in this thesis will be the argument structure of complex predicates, we shall nevertheless briefly look at some issues relating to their morphological structure.

Research into complex words has addressed various issues relating to their formation; questions which arise range from more general ones such as *Is there a separate word formation component? Are words formed in the lexicon or in the syntax? Is word formation prior to syntax or does it interact with syntax at every level of representation?* to more specific ones like *Are affixes listed in the lexicon? Does derivational and inflectional morphology belong to the same component? Do operations on affixes follow a levelled ordering?* In early generative grammar, the word-building function of a word formation component, a lexicon, was subsumed by the syntactic

component, and little, if any, attention was paid to the nature of a derived word, this being assigned the same kind of derivation as a phrase. The general lines of research followed the pattern in which phrases were formed, that is, by transformational rules. In his seminal work *Remarks on Nominalization*, Chomsky argued that derived nominals were formed prior to syntax. This work set the stage for most of the research in the area, which has taken several turns since then.

Postulating an autonomous morphological component within the grammar made researchers consider the nature and properties of lexical entries themselves as well as processes that create complex words. Aronoff (1976), for example, argued for the existence of Word Formation Rules as part of the lexicon. According to this view, there was a finite set of rules that created words, similar to the view held at the time about the syntactic component containing a finite set of rules creating phrases. Invoking ordered rules had implications for the properties of lexical entries, in terms of dividing affixes into two separate classes according to what kind of units they could attach to. As a result, the concatenation of one class of affixes were thought to precede the concatenation of the other group.

Differences between affixes have attracted the attention of most, if not all researchers in morphology. Of particular relevance to the present work is the debate on differences between derivational and inflectional affixes, these two being treated as distinct classes in traditional grammatical analyses. More recently, it has been claimed (Anderson 1982, among others) that derivational word formation is relevant to morphology whereas inflectional processes are syntactic operations. This view has significant implications for the formation of complex words, since it divides them into two groups according to their status vis-a-vis the components: some were assumed to be formed in the lexicon and others in the syntactic component. Such a division between words is subscribed to by Aronoff (1976), Fabb (1984), Marantz (1984), Badecker and Caramazza (1989), among others. Although not directly relevant to the arguments

centring around derivational versus inflectional morphemes, one can also mention suggestions by Borer (1988) who argues for the presence of morphological processes interacting with distinct syntactic levels of representation, with lexical insertion taking place at more than one level.⁵

Theories which oppose having a distinction between words in the above mentioned sense fall into two categories. One of these is the view which assigns word formation processes predominantly to a separate word formation component, deriving the differences between derivational and inflectional mechanisms by enriching features and/or the category labels of the lexical items (Lieber 1981, Williams 1981a, Selkirk 1982, Jensen and Stong-Jensen 1984, Di Sciullo and Williams 1987). The other view, by contrast, takes most word formation processes to be of a syntactic nature, attributing only listed items and a relatively impoverished set of Word Formation Rules to the lexicon. Such views take word formation to occur between levels of syntactic representation (Sproat 1985-86, Lieber 1988, and Baker 1988). Zubizarreta (1987) has a similar model where mechanisms of word formation and processes of syntax are treated as a continuum.

The distinction between so-called lexical and syntactic processes is not a pretheoretical notion and is, moreover, tightly linked to one's views on how the lexical and syntactic components are defined. The approach in this work is based on the assumption that the lexical/syntactic dichotomy regarding word formation processes only makes sense in frameworks which order the components in terms of the type of information that can be manipulated in these components. In this sense, all of the models alluded to above, with the exception of those advocated in Borer (1988), Kageyama (1989) and Sadock (1991), take the lexicon as containing information which is inaccessible to syntactic operations. Hence lexical items with configurational information, such as causative and passive affixes seem to create problems only because the lexicon/syntax divide is defined in terms of the extent to which they allow access

to the interaction of configurational information. A rather different view is held by Anderson (1992) regarding the role of configurational properties in distinguishing between components. What he suggests is that word formation and sentence formation are subject to different rules, but both have access to syntactic information (what we have been calling configurational information) as well as phonological and semantic information. I shall be adopting a similar view. Particles within words, if they contain configurational information, can interact freely with other syntactic processes without necessarily losing the ability to interact with so-called lexical processes.

1.122 Complex predicates and structure preservation

The analysis of grammatical function changing processes followed similar lines to those in the development of word formation processes. It was observed in the earlier stages of transformational grammar that in passivisation, the archetypal transformational process, the (argument) structure of a phrase could not be destroyed. If an argument was present in an active clause, it had to be present in one form or another in the passive clause. This observation was formalised as the Structure Preservation Constraint (Emonds 1976).

With the transition from rule systems to a system of principles and parameters, the notion of structure preservation came to be formalised as the Projection Principle (Chomsky 1981). This principle states that the lexical (categorical) properties of lexical items are present at all syntactic levels. That is, a subcategorised element of a verb (and, of a VP in the case of subject (Chomsky 1982, Rothstein 1983)) must be present at all levels of representation. Notice that this aspect of phrase structure can be stated in such a way that it becomes contingent with the analysis given to word formation.⁶ The reason for this is that if one is committed to the strategy whereby words are formed in the syntax, one must also be committed to the view that the parts that make up a word must project their subcategorisation properties to the syntax. If, on the other hand, one assumes that words are formed by lexical processes, one can still hold the above

view, but there is also the option that subcategorisation properties somehow merge in the lexicon, as for example Alsina (1990) claims. To give an example, taking a complex predicate like *koş-tur-du* 'made x run' as in (1b), the question arises as to which of the lexical items have their lexical properties represented syntactically: the subcategorisation properties of *koş* and *-tur* separately, or of *koştur* as a whole.

What has been said so far suggests that approaches to word formation with respect to grammatical function changing phenomena fall into two broad groups corresponding to the lexicon/syntax dichotomy discussed in the preceding subsection: models in which complex predicates are formed in the lexicon, and those in which they are formed within a multi-layered syntax. Among the former are works in Lexical Functional Grammar (Alsina 1990, Bresnan 1982, Bresnan and Kanerva 1989, Mchombo 1978), and Zubizarreta (1985, 1987). Models which analyse complex predicate formation as a syntactic process include Marantz (1984) and Baker (1988). The rest of this chapter will be devoted to the evaluation of an analysis couched within the latter approach, and in what follows, I will focus on one of the most detailed works on grammatical function changing processes, the "Theory of Incorporation" which is elaborated in *Incorporation: A Theory of Grammatical Function Changing* by Baker (1988). The reason for choosing this work as a starting point is two-fold. Firstly it provides a comprehensive illustration of the points touched upon in the previous two sections. But more importantly it will serve as a guideline for making explicit the problems that are faced when analysing complex predicates.

1.2 The theory of Incorporation

Baker's theory of incorporation is set within the Government and Binding framework of Chomsky (1981, 1986a,b), drawing on the well-formedness conditions on movement put forward by Lasnik and Saito (1984). This framework adopts a syntactic model with a hierarchy of levels of syntactic representation. Lexical projection takes place at D-structure which is linked to S-structure through movement constrained by principles of

grammar.⁷ The effect of this is a highly abstract characterisation of structure for what are morphological complexes. The relation between S-structure and the level of Logical Form (LF) is also mediated through movement similar to that between the two previous levels, along lines suggested in May (1985). The principles which constrain movement are independently motivated by the various modules of Universal Grammar.

Baker claims that complex predicates of the form discussed in the first section (except reciprocal constructions) and verbal predicates containing nouns are formed in the syntax as a result of movement from D-structure to S-structure. What makes this hypothesis unique is the suggestion that grammatical function changing phenomena are induced by the interaction of independent principles, thereby obviating the need to postulate a specific system of rules for each type of complex predicate.⁸

In descriptive terms, the process of incorporation involves the movement of a head (an X^0 category in terms of X' theory) to a higher head position. The result of this movement has to conform to principles of X' theory, relevant details of which will be given below. The outcome of this movement is a morphologically complex unit, a complex predicate. In theory, there can be as many instantiations of head movement as there are heads, unless the movement is constrained by independent principles. Baker deals with the kinds of head movement relevant to grammatical function changing processes, and of these only two will be of primary interest to us here: VP-to-Comp/V--to-C movement that produces causative complex predicates, and I-to-V movement that produces passive complex predicates. The reciprocal complex predicate, Baker claims, is a lexical process, and therefore external to the domain of syntactic incorporation. As for reflexivisation, this is not analysed under incorporation.

I will approach the theory of incorporation through a specific instantiation of this process, verb incorporation (VI), which underlies causativity, rather than in a more general and abstract fashion, for reasons of convenience. Since VI is one of the two

main types of incorporation of interest to us here, it will serve the purpose of outlining the theory, as well as constituting an introduction to the following section in which most of the problems illustrated involve causativity. First, however, let us look at how languages represent causativity.

There are several structurally different ways of expressing causativity. One of these is to embed a clause within another, the result of which is a biclausal surface string. In such structures, the embedded clause is the complement of the causative verb:

- (13) a. John made [his mother do the laundry].

German

- b. Hans liess [den Mann kommen]...
 let the man-ACC come

Hans let the man come.

(From Comrie 1976)

Turkish

- c. Zeynep [berber-in saç-(n)ı kesmesi-]ni sagla-dı.
 barber-GEN hair-ACC cut-GER-POSS-ACC cause-PAST

Zeynep caused the barber to cut her hair.

In the sentences in (13) the section in brackets is a functional complex and serves as the complement of the matrix verb. Constructions such as (13c) will be referred to as periphrastic causatives.

In languages in which affixation features prominently, there may be another way to express causativity: by means of a bound morpheme, as the examples below illustrate:

Turkish

- (14) a. Zeynep berber-e saç-ı-nı kes-tir-di.
barber-DAT hair-POSS-ACC cut-CAUS-PAST
Zeynep made the barber cut her hair.

Kinyarwanda

- b. Umugabo y-a-kubit-iish-ije umugore abaana.
man 3-PAST-beat-CAUS-ASP woman children
The man made the woman beat the children.

(From Kimenyi 1980)

Japanese

- c. Taroo ga Ziroo o tomar-ase-ta.
SM OM stop-CAUS-PAST
Taroo made Jiroo stop.⁹

(From Shibatani 1976)

Such constructions will be referred to as morphological causatives.

A third type of causativisation occurs in Romance languages where the causative is a separate lexical item which is fully inflected in terms of tense and agreement and usually occurs adjacent to the verb allowing only a limited type of intervention by any lexical item. So in one sense, the causative verb and the embedded verb behave like a single unit, hence displaying a similarity with morphological causatives; on the other hand, they also resemble periphrastic causatives in terms of the inflectional properties of the causative verb:

(15)

French

- a. Marie fait manger le gâteau à son fils.
make eat the cake to her son
Marie makes her son eat the cake.

(From Roberts 1980)

Spanish

- b. Hice construir el edificio a las criadas.
I-made build the building to the maids.
I made the maids build the building.

(From Comrie 1976)

Italian

- c. Maria ha fatto riparare la macchina da/a Giovanni.
 has made repair the car by/to
Maria has made Giovanni repair the car.

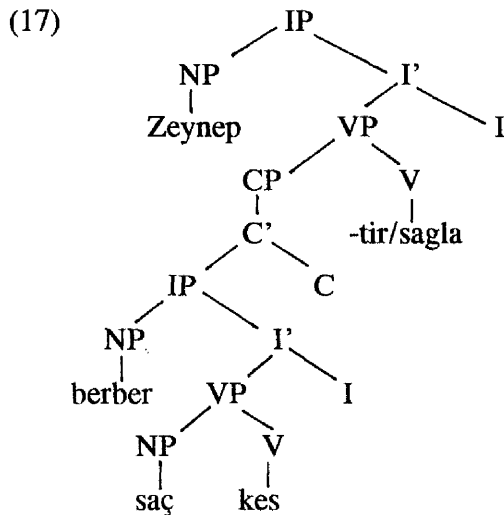
(From Burzio 1986)

Superficially, then, there are three types of causative constructions: periphrastic ones with two predicates, morphological ones with a complex predicate, and Romance causatives that display properties similar to both periphrastic and morphological causatives. However, the underlying conceptual structure of all causatives seems to be identical. They express a proposition of the form *X CAUSE Y* where *X* is a variable ranging over the set of entities that can serve as an agent, and *Y* is a proposition.

It is this conceptual similarity that is the basis for the theory of incorporation. At the heart of Baker's analysis lies an assumption regarding the configurational identity of thematic structures. This assumption is stated as an axiom of the theoretical content of incorporation. The Uniformity of Theta Assignment Hypothesis (UTAH) states that "identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure".¹⁰ The sentence in (13c), which is a periphrastic causative has the same D-structure representation (in terms of thematic structure) as the sentence with a morphological causative as in (14a) both of which are repeated below:

- (16) a. Zeynep berber-in saç1-(n)1 kes-me-si-(n)i sagla-dı.
 barber-GEN hair-ACC cut-GER-POSS-ACC cause-PAST
 Zeynep made the barber cut her hair.
- b. Zeynep berber-e saç1-(n)1 kes-tir-di.
 barber-DAT hair-POSS-ACC cut-CAUS-PAST
 Zeynep made the barber cut her hair.

The D-structure of both (16a) and (16b) would be as illustrated in (17) with some obvious differences in the representation of the functional elements such as the gerundive and the possessive in (16a). (Any details not relevant to the points currently under discussion, such as the representation of tense, agreement and other functional elements, will be omitted in this and subsequent representations):

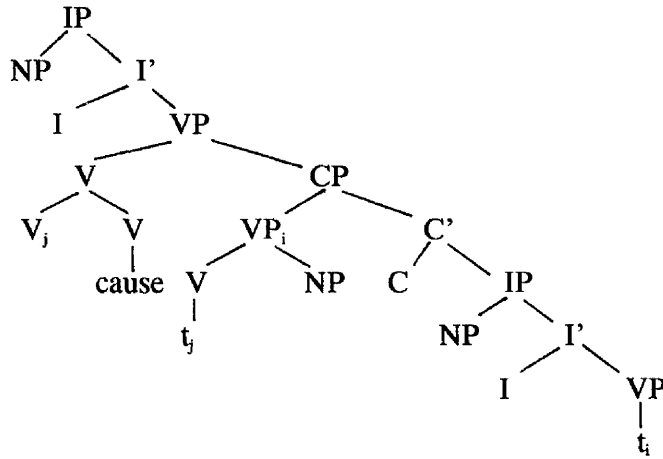


The basic properties of a D-structure representation as demonstrated in (17) include (i) the base generation of the causative affix *-tir* as the head of a verbal projection, and (ii) the subcategorisation properties of the affix, i.e. that it has a CP complement.

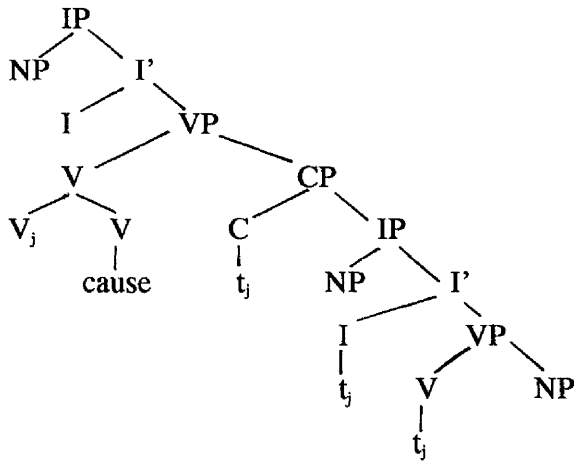
The next step involves the articulation of the S-structure of (16b) by means of movement from D-structure. The formation of an appropriate S-structure configuration complies with the structure preservation principle and the Empty Category Principle (ECP).¹¹ The former states that an element can only move into a position of its own category. As for the ECP, this is a well-formedness condition on movement which states that all traces of moved elements must be properly governed (in the sense of Lasnik and Saito 1984 and Chomsky 1986b). These two principles constrain all processes of incorporation. Morphological causatives specifically involve the movement of the head of VP to a higher position occupied by an element of the same kind (C, I and V).¹² The constraints on head movement are similar to those on movement of maximal projections (Chomsky 1986a, 1986b); traces must be antecedent governed, a condition that follows from the antecedent of a trace being disallowed in a theta marked position, and from the antecedent-trace relation which must satisfy requirements of subadjacency.

The theoretical framework outlined above predicts two kinds of movement: VP-to-COMP movement and V-to-C movement, illustrated in (18) and (19) respectively:

(18) VP-to-COMP movement (SVO languages):



(19) V-to-C movement (SVO languages):



In (18) the entire VP of the embedded clause moves to the specifier position of the CP (the COMP position). It is from there that the verb of the lower clause incorporates into the matrix verb. In (19) the embedded verb alone moves successive cyclically, through I and C to incorporate into the matrix verb, leaving behind its object NP in the embedded clause. Some specific empirical problems which arise with this analysis will be discussed subsequently.

The complex verbal unit has certain case-marking properties, theta-assignment properties and government properties. Baker claims that the complex predicate can assign as many theta roles as the sum of its parts. This is to guarantee that all NP arguments are assigned a thematic role, which accounts for (at least one of the clauses of) the Θ -criterion, namely, that all arguments are assigned a thematic role. The government properties of the complex verb are stated in terms of a corollary of the notion of government, namely that a complex verb can govern everything its parts govern.¹³ Finally, the case assigning properties of the complex predicate are defined in terms of the case assigning properties of a simple verb in the language concerned. That is, a complex verb can only assign as many cases as assigned by an underived verb in that language. Processes of incorporation are thus directly linked to idiosyncratic case marking properties of languages, a factor which Baker uses in categorising languages into the following types: double-structural case assigning languages, partial double-structural case assigning languages, and non-double-structural case assigning languages. Romance languages and certain other languages like Moroccan Arabic require additional defining factors and form distinct categories.

Since, according to Baker, complex predicates are formed by syntactic derivation morphological theory has a limited role. In fact, Baker assumes morphology to be one of the modules of Universal Grammar. In this sense it is a sub-theory of grammar rather than a concept which is relevant to the lexicon. There are two basic constraints imposed by "morphology-theory": the constraint guaranteeing that affixes cannot occur unattached at S-structure (the Stray Affix Filter), and that X^0 categories cannot contain traces.

Having outlined the theory of incorporation, I will now turn to some problems posed by this model. These include overgeneration in Kinyarwanda, weakening the power of Case Theory, inability to handle the selectional restrictions imposed by the presence of the causative affix, the misrepresentation of the scope of negation in

complex predicates and the inconsistency in the interaction of grammatical function changing affixes with category changing affixes.

1.21 Problems with the theory of Incorporation

The first question that the theory of incorporation raises concerns the nature of the enrichment of the syntactic component. Proposals within the GB framework concerning the enrichment of syntax have taken the form of generating additional maximal projections such as DP, NegP, TP, AGRP, AGRP_{obj} (Abney 1986, Fukui and Speas 1986, Chomsky 1991a,c, Pollock 1989). All of these projections involve functional categories (mostly affixes) which, in traditional terms, correspond to inflectional elements. There have been arguments in the literature concerning the unrestrictedness of adding a new maximal projection whenever there is an affix. Iatridou (1990), for example, argues that assigning universal status to all such affixes would, in effect, mean filling the syntax with maximal projections that would have to remain as unfilled elements in languages which do not have these affixes. She specifically quotes affixes which mark causativity, politeness, indirect object agreement, and convincingly argues that claiming that these exist in the syntax of all languages provides a syntax which is too unrestricted.

It is by no means certain that the theory of incorporation allows an enrichment of the syntax in this fashion. In fact, restricting the model as he does by linking it to UTAH, Baker would be forced to regard the generation of heads like CausP, RefIP and PassP (this latter having indeed been proposed as a maximal projection by Ouhalla 1990a and Rivero 1990) as caveats in the theory, if not downright illegitimate. This is because having such maximal projections would not only weaken the theory considerably, but also jeopardise the notion of identity between thematic structures and syntactic structures. Having CausP, PassP and the like on the one hand, while maintaining the UTAH on the other would leave no option but to assign rules to causative and passive heads in order to comply with the UTAH. Such a move would

take Baker back to a rule system which he initially sets out to abandon. On the contrary, Baker commits himself to a (by now) conservative and more restricted syntax.

However, incorporation as head movement does lead to limitless freedom in syntactic structures in another way. For one thing, allowing heads to move as long as the ECP is respected does not explain why only certain incorporated structures occur in languages. A simple example is the ungrammaticality of noun incorporation in English. Secondly, the unrestricted nature of movement allows a head to move into another head position, and there is no independent reason why it should not then move out.¹⁴

As for increasing the power of syntactic processes by means of carrying word formation processes into the syntax, it ought to be clear from the brief exposition in section 1.121 that incorporation is, in effect, a step taken in this direction.¹⁵ Since UTAH plays a central part in the model in terms of making reference to lexical properties and thus has a fundamental status in establishing the link between lexical items and phrase structure, it will be appropriate to evaluate this part of the model first.

The hypothesis that identical thematic structures map onto identical structural positions at D-structure forces one to question the limits of allowing a mapping between semantic relations and syntactic relations. As Baker correctly points out, suggestions along similar lines have been made by proponents of Relational Grammar (See Perlmutter and Postal 1983, among others). In GB as well, the tendency to generate the surface subjects of unaccusative verbs in the D-structure object position within the VP amounts to drawing parallels between semantic properties and syntactic positions. It may not be so difficult to assign a specific structural position to what has been loosely called theme. But reserving a unique syntactic position for semantic properties of lexical items would lead to the reduction of semantic properties to syntactic structures. It would, for example, mean that goals, themes, experiencers, benefactors, and other thematic roles could each have separate positions in the syntax (cf. Belletti and Rizzi

1988). If one adheres to the Bakerian view it might be a possibility that unique positions have to be assigned to each thematic role in syntactic configurations. This could then be used as a basis for assigning unique cases to each NP in ways similar to Case - Grammar (Fillmore 1968).

Another problem related to the representation of thematic structure is the connection of thematic roles with case assignment from the perspective of Case Theory. This point, which turns out to be the most problematic theory internal aspect of Baker's model, will be dealt with in section 1.212.

I would now like to turn to specific problems concerning the analysis of causativity and passivisation.

1.211 Overgeneration: the case of Kinyarwanda

The grammar of Kinyarwanda and Japanese, both double-accusative languages in Baker's terms, allows a verb to assign structural case to more than one NP. The evidence for this comes from passive constructions. It is known that in these languages either of the NPs within a VP can become the subject when the clause is passivised.¹⁶ Since verbs can assign two structural cases in these languages, no problems relating to case marking arise in causative constructions and both NPs within the VP can be assigned case (examples are taken from Baker unless stated otherwise):

Kinyarwanda

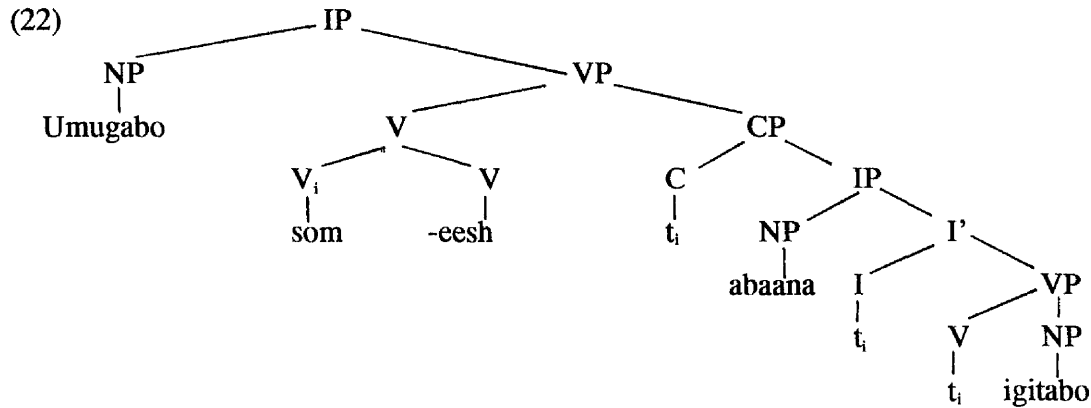
- (20) Umugabo a-ra-som-eesh-a abaana igitabo.
man 3-PRES-read-CAUS-ASP children book

The man is making the children read the books.

Japanese

- (21) Taroo wa Hanako ni sono hon o kaw-**ase**-ta.
TOP DAT that book-ACC buy-**CAUS**-PAST
Taro made/let Hanako buy that book.

Let us first assume, following Baker, that the type of incorporation that takes place in Kinyarwanda and Japanese is V-to-C movement as illustrated in (19). The result of this type of movement is the S-structure representation given below. (This representation applies equally to the Japanese sentence in (21)).



In (22), the embedded verb has moved from its D-structure position (the lowest t_i) first to I, then to C, and has finally incorporated into the main verb *-eesh*. This, as explained above, is the essence of V-to-C movement. Recall that the complex verb of a causative construction can assign as many cases as are allowed in the respective language (two in this case). There are two possible recipients of case-marking: the causee and the embedded object. As no barriers intervene,¹⁷ the complex verb will be able to govern both NPs and provide each one with a case, a constraint which is essential for the visibility of NPs. Therefore, V-to-C movement predicts correct results.

As far as verb incorporation goes, V-to-C movement accounts for the data in both languages. It is with respect to the combination of the passive with the causative

that the two languages differ; in this case there are some differences which V-to-C movement does not seem sufficient to explain. This forces Baker to look at the other option for incorporation as a possible solution to the problems created: namely VP-to-COMP movement. The difference between Kinyarwanda and Japanese regarding the interaction of the causative with the passive is illustrated in the following examples:

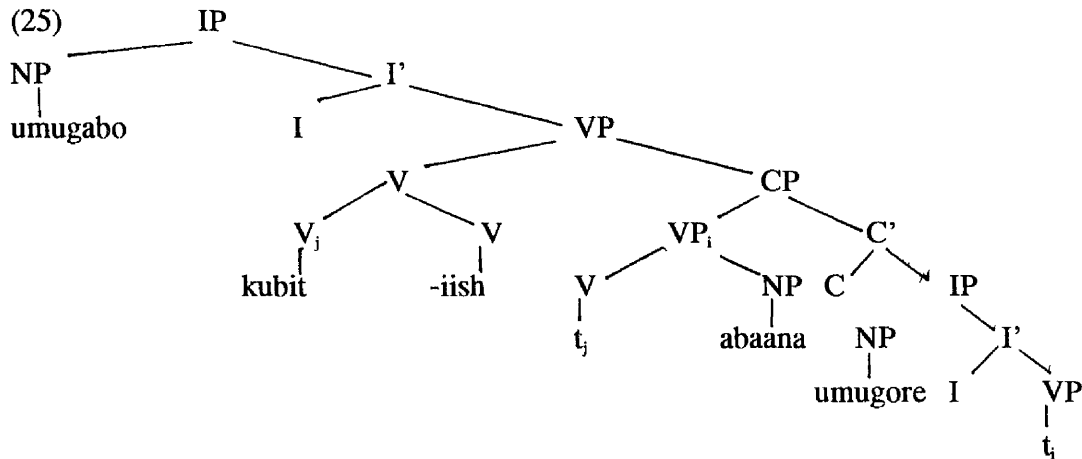
Kinyarwanda

- (23) Inzu i-r-uubak-iish-w-a abakozi n'umugabo
 house 3-PRES-build-CAUS-PASS-ASP workers by man
 The house is being by the man made to be built by the workers.

Japanese

- (24) *Sono hon wa Taro ni Hanako ni kaw-ase-rare-ta.
 that book TOP by DAT buy-CAUS-PASS-PAST
 That book was by Taro made to be bought by Hanako.

The structural difference between (23) and (24) is that the embedded object can become the subject of a passive clause in Kinyarwanda, whereas this is not an option in Japanese. In Japanese, when a causative is passivised, it is the causee, the embedded subject, that becomes the subject of the matrix clause, and not the embedded object. Such differences between seemingly similar languages lead Baker to consider the other type of VI, namely, VP-to-COMP^(i.e. SPEC CP) movement, as an option for Kinyarwanda. Baker points out that if VP-to-COMP were an option for double accusative languages, one would have to assume an additional lexical property that belongs to "'cause' type of verbs" in such languages. This property is, by claim, C-deletion. The reason for making such an assumption is as follows: if the lower VP moves to the CP position, the complex V will not be able to govern the causee, because C, the head of CP, will be distinct from the complex V. This will be by virtue of the fact that the V will have moved together with its object NP, thus not picking up each head on its way to its higher position, as in (25):



As there will be CP - a barrier - between the complex verb and the causee, the latter will be ungoverned and will therefore not receive case. For this kind of movement to be an option for a double-accusative language, the only possibility is for the 'cause' verb to delete the head C. In this way CP will cease to be a barrier, for it will not have a head that is distinct from V. Baker claims that Kinyarwanda 'cause' type verbs have this property but Japanese 'cause' type verbs do not. Now recall that this argument was initially articulated in order to explain the asymmetry between (23) and (24). In Japanese, the lexical properties of the 'cause' verb will not allow the causee to be governed if VP-to-COMP movement takes place. Therefore there will be a barrier between the complex verb and the embedded subject. The embedded subject will be left without case and the structure will be ungrammatical. So the asymmetry between Kinyarwanda and Japanese is stated as follows: Kinyarwanda has both V-to-C movement and VP-to-CP movement (with the proviso that C-deletion is a lexical property of the 'cause' verb) but Japanese only allows V-to-C movement.

Accepting the analysis above on general theoretical grounds would still leave some empirical issues unresolved because of the predictions it makes about the structure of causative sentences in Kinyarwanda. Considering that VP-to-COMP movement is an option for Kinyarwanda, sentences like (26) ought to be grammatical, for the simple

reason that a verb moving with its direct object before incorporation would cross the embedded subject, leaving the latter in a position where it is not adjacent to the complex verb:

- (26) Umugabo y-a-kubit-iish-ije abaana umugore.
 man 3-PAST-beat-CAUS-ASP children woman
 Intended reading: The man made the woman beat the children.

However, this sentence does not have the intended reading, and can only mean 'The man made the children beat the woman.'¹⁸ Therefore the movement that produces (26), VP-to-COMP, cannot be an option for Kinyarwanda.

This leaves Kinyarwanda with only one type of incorporation in causative constructions, namely V-to-C movement. However, it was the very insufficiency of this analysis in explaining the asymmetry between this language and Japanese that initially prompted Baker to adopt VP-to-COMP movement as an additional mechanism in Kinyarwanda. This leaves open the question as to why these two languages behave differently when the causative is passivised.

1.212 Case Theory

A major problem that arises on the analysis sketched above is a theory-internal one and it concerns Case Theory. Notice that the complex predicate is a [VV] compound which therefore has to be analysed in terms of certain properties that are prevalent in verbs. As mentioned above in section 1.2, the complex verb in Baker's view has as many theta roles to assign as the two verbs (the matrix verb and the embedded verb) put together. However, in terms of case marking, the complexity of the verb is irrelevant, and the complex verb can only assign as many cases as a simple verb in that language can. This alone undermines the foundations of a biclausal analysis for causatives, since it amounts to admitting that the complex predicate is actually simplex in S-structure in at least one

sense, a major drawback given that the most significant aspect of this analysis is the attempt to maintain the complexity of such predicates in the syntax. In fact, the limitation imposed on the complex verb (such that it has fewer cases to assign than its parts put together) is hardly surprising since case marking is a surface phenomenon. But this creates problems for Baker as there are bound to be more potential theta role recipients than there are cases to assign to them. What seems to be an ensuing mismatch is actually common to analyses that presuppose identity of syntactic and semantic phenomena.

Indeed, it turns out that certain NPs, usually those in the subject position of the embedded clause (henceforth, the causee) fail to get assigned case through mechanisms licensed by Case Theory. In an attempt to handle this problem, Baker proposes that a case insertion rule operates where there is no other way of guaranteeing the visibility of an NP, this usually being the causee.¹⁹ To give an example, since the dative marked NP *berbere* 'to/by the barber' in (14a) cannot receive its case inherently (at D-structure) or under government (at S-structure), it receives case through this case insertion rule. Such a rule, in effect, guarantees that a case can be assigned to an NP whenever it cannot receive case through mechanisms that follow from Case Theory. But how can one accommodate such a rule within Case Theory? The problems created by this rule are obvious, and are, in fact, serious enough to make one reconsider the content of Case Theory. Like all sub-theories, Case Theory imposes certain conditions, the violation of which induces ungrammaticality. If there is a case insertion rule that salvages certain constructions, what need is there for Case Theory?

Positing a case insertion rule leads to other redundancies and inconsistencies in the theory. Considering that the theory has a case-insertion rule with no apparent restrictions, it is not clear why one should resort to the option where the property of C-deletion is a lexical property of the 'cause' verb, as it was argued to be the case with Kinyarwanda. The causee which is claimed to be left without case could become

visible if such a rule existed. If this cannot happen, what is the power of the case insertion rule? Japanese causative constructions are actually an indication that such a rule could not apply anywhere. But if it cannot apply anywhere, what restricts its area of application?

Notice that explaining Kinyarwanda and Japanese causatives by means of V-to-C movement is problematic in terms of other aspects of Case Theory as well. The problem was that only the causee of Japanese causatives could become the matrix subject when passivised, whereas in Kinyarwanda causatives the lower object, too, could raise to become the subject of a passive. If passivisation can roughly be taken as the "absorption" of case (i.e. the reduction of cases assigned by one, along the lines of Jaeggli 1986 and Roberts 1987), a position which Baker adopts when explaining certain properties of partial double case assigning languages, then how is one to explain the fact that either of the NPs can be the target of such a process in Kinyarwanda, whereas the only NP for which no case is left is the causee in Japanese? The case insertion rule, therefore, is a stipulation which weakens the power of Case Theory considerably.

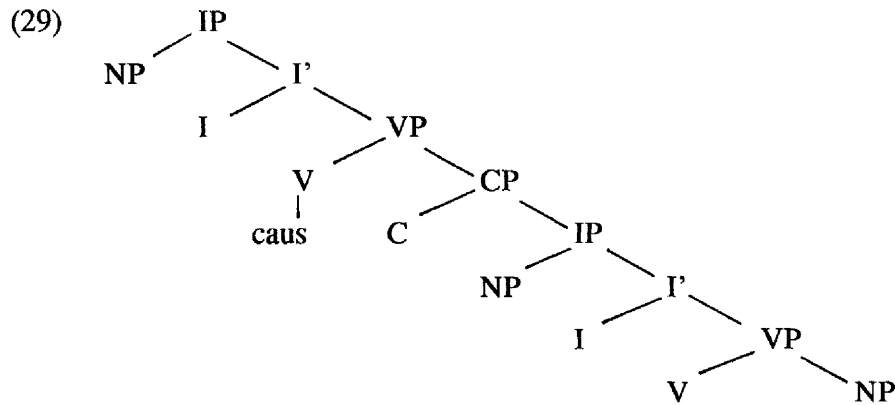
1.213 Morphological Gaps

A further problem arises in V-to-C movement with respect to causative/passive combinations. The causative affix can combine with the passive affix in one of two ways:

(27) V-CAUS-PASS

(28) V-PASS-CAUS

The passive morpheme has the status of an argument in Baker's analysis and is generated under INFL at D-structure. Baker assigns the representation in (29) to sentences with either sequence:



The passive morpheme can be base generated under either the higher or the lower I. If it is generated under the higher node, it does not matter what kind of causative incorporation the language selects; the result will be the sequence in (27). The reason for this is as follows: if the language has VP-to-Comp movement, the lower VP moves to the COMP position under CP, and from there, having incorporated into the V 'caus', the whole complex verb moves up and incorporates into the passive morpheme. If the incorporation of the causative is of V-to-C type, the lower verb moves on its own to attach to the causative first and then to the I node to incorporate into the passive there. However, if causative and passive affixes combine as in (28), the two types of VI will yield different results. For the passive affix to occur inside the causative affix as in (28) the verb would first have to incorporate into a passive morpheme and then move upwards to incorporate into the causative verb. In order for this to happen, the passive would have to originate under the lower I node to produce the desired results. This would cause no problem for V-to-C movement as the V moves individually. However it would be impossible for a language to have VP-to-COMP type causativity and have the passive affix occur inside the causative affix at the same time. This is because the passive would again have to occur under the lower I; but this time the V, which moves with its NP, could not incorporate into the passive under the I, as this node, being a head, cannot be the landing site of movement for a phrasal category. Therefore, the analysis would predict that *V-PASS-CAUS* sequences

are impossible in languages which have VP-to-COMP type VI.

This prediction is borne out by the fact that in languages like Turkish, which Baker argues select VP-to-COMP type VI, the causative can indeed occur inside the passive, but not vice versa:

- (30) a. Zeyneb-in saç-ı berber-e kes-tir-il-di.
 -GEN hair-POSS barber-DAT cut-CAUS-PASS-PAST
 Zeynep's hair was caused (by someone) to (be) cut by the barber.

- b. *Zeynep saç-ı-(n)ı kes-il-dir-di.
 hair-POSS-ACC cut-PASS-CAUS-PAST
 Intended reading: Zeynep had her hair (be) cut.

Again, also as predicted, V-to-C type languages can have either sequence (27) or (28) when the causative combines with the passive (with different interpretations; see Baker (1985)). That is, the passive morpheme can occur inside the causative morpheme in these languages:

Chamorro

- (31) Si nana ha na'-ma-fa'gasi i kareta li lalahi.
 PN mother 3Ss-CAUS-PASS-wash the car OBL males
 Mother had the car be washed by the boys.

With respect to the position of the postverbal NPs, I argued above that Kinyarwanda could not be a VP-to-COMP type language in terms of the incorporation of causatives. The only option was that it is a V-to-C type language. If this is so, there is nothing to exclude, in the theory that Baker sets up, sequences like (28) where the passive morpheme is inside the causative. This sequence, however, does not occur in

Kinyarwanda. Coupez (1985) indicates that *V-w-iish* or *V-w-y* (both *V-PASS-CAUS* sequences) are ungrammatical in Kinyarwanda. Baker, in fact, states that not all languages that have *V-to-C* type causatives have *V-PASS-CAUS* sequences. However, he does not provide a syntactic account for this phenomenon, but merely attributes it to morphological gaps. Hence, Baker's proposal that Kinyarwanda has both *VP-to-COMP* and *V-to-C* incorporation is not merely unwarranted: the fact that he appeals to morphological gaps to explain why Kinyarwanda does not have a certain sequence (i.e. *V-PASS-CAUS*) actually undermines the syntactic nature of his proposal.

1.214 Subcategorisation

In a variety of languages such as Uighur, Turkish, Mongolian, Hungarian (Hetzron 1976), Japanese and Korean (Shibatani 1976), the causee appears to have idiosyncratic semantic properties, namely that it cannot refer to inanimate objects.

Recall that in Baker's model the thematic structure of each verb is generated at D-structure. The Projection Principle then guarantees that this thematic structure is retained throughout the levels of representation. But what happens to the selectional restrictions imposed on the arguments of verbs? On Baker's analysis, one would have to assume that once a NP is licensed to appear as an argument with specific semantic properties at D-structure, it will have the same properties at all levels because once an element has entered a syntactic derivation it cannot have access to lexical mechanisms. In other words, the base generation of the causee as the subject of the embedded clause fixes its lexical properties vis-à-vis the verb that selects it, i.e. the embedded verb. Consider sentences like (32a-33a), which can occur as the embedded clause in causative constructions like (32b-33b):

Turkish

- (32) a. Adam ev-i yık-tı.
 man house-ACC demolish-PAST
 The man demolished the house.

- b. Adam-a ev-i yık-tır-dı-m.
 man-DAT house-ACC demolish-CAUS-PAST-1
 I made the man demolish the house.

Mongolian

- (33) a. John hani:g zurav.
 wall-ACC scratch-PAST
 John scratched the wall.

- b. Bi: hani:g John-ge:r zura:v.
 I wall-ACC -by scratch-CAUS-PAST
 I made John scratch the wall.

As the strings in (32a) and (33a) constitute well-formed IPs, one can reasonably assume that they may occur in embedded constructions, such as those in (32b) and (33b). Now consider the pairs below, which differ from (32) and (33) only in terms of the non-human property of the agent (causee):

Turkish

- (34) a. Bulldozer ev-i yık-tı.
 bulldozer house-ACC demolish-PAST
 The bulldozer demolished the house.

- b. ?Buldozer-e ev-i yık-tır-dı-m.
 bulldozer house-ACC demolish-CAUS-PAST-1
 Intended reading: ^{I made} The bulldozer demolish the house.

Mongolian

- (35) a. Şire: hani:g zurav.
 table wall-ACC scratch-PAST
 The table scratched the wall.
- b. ?Bi: hani:g şire:-ge:r zura:v.
 I wall-ACC table-by scratch-CAUS-PAST
 Intended reading: I made the table scratch the wall.

(34b) can only be interpreted, if at all, as inducing a metaphoric reading, one where the non-human *bulldozer* is personified. The same is true of (35b). By contrast, the (a) sentences of the pairs do not have a metaphoric interpretation. Although the semantic relationship that holds between the verb *yık* 'demolish' and its agent *bulldozer* is identical in (34a) and (34b), the selectional restrictions imposed on the argument *bulldozer* in the two constructs are different. It is also worth noting that in the periphrastic counterpart of (34b) *bulldozer* would not be personified. How is it possible to characterise such differences within a model which derives morphological causatives from underlying biclausal configurations? Given that the periphrastic counterparts of (34b) and (35b) do not have a metaphorical reading, how can UTAH be maintained? These facts are irreconcilable with VI. If one were to adopt Baker's analysis, the selectional restrictions imposed upon a certain argument would have to be altered somewhere in the derivation between D-structure and S-structure, a procedure which is clearly illicit given the structure of the syntactic component.

1.215 Scope of negation

Another instance where a verb incorporation strategy creates problems is causative sentences which are negative. Negation is realised by means of a suffix in Turkish which follows the causative morpheme as in (36):

- (36) Fatma-yı oku-t-ma-dı-lar.
-ACC read-CAUS-NEG-PAST-3PL
They didn't make Fatma read.

(36) exemplifies the only position in which the negative suffix can occur, and sequences as (37) are ungrammatical:

- (37) *oku-ma-t-dı-lar
read-NEG-CAUS-PAST-3pl

It has been argued that Baker's analysis fails to capture the difference between the structures in (36) and (37). In particular Li (1990) argues that if the embedded clause is an IP (dominated by CP), there is nothing to preclude the negative marker (and other inflectional elements like tense and agreement) from occurring inside the causative marker as in (37), an option which, apparently, is universally ruled out. Instead, he proposes that the embedded clause is a VP, which does not include any inflectional elements, thus ruling out intervening functional heads in incorporation processes. Li's proposal which posits the selection of a VP rather than a CP as the complement of the matrix causative verb is able to account for the grammaticality of (36) and the ungrammaticality of the sequence in (37).

As far as representation at S-structure is concerned, Li's proposal proves to be advantageous over Baker's, since it correctly eliminates the option in which the negative suffix precedes the causative marker at this level. There is, however, one problem that

remains unresolved in both Baker's and Li's characterisation of VI: the representation of the scope of negation. Li's analysis does not include the possibility in which the causative marker is outside the scope of negation at LF, the level where scope is represented, since Uighur, from which his data is taken, does not appear to allow such an interpretation (taken from Li 1990):

- (38) Jon Meri-ni yügür-t-mi-di.
 -ACC run-CAUS-NEG-PAST

(i) John did not make Mary run.

(ii) *John made Mary not run.

The Uighur sentence in (38) appears to have only one interpretation; (38ii), which is semantically well-formed, is not available as an interpretation of a [V-CAUS-NEG] sequence in Uighur.²⁰ This leads one to the conclusion that the ordering in the surface string directly reflects that at LF.

It has been observed by Bainbridge (1987) that causative sentences in Turkish display scope ambiguities.²¹ These are exactly of the kind Li claims are precluded in Uighur sequences. Similar facts hold for Mongolian:

Turkish

- (39) a. John Mary-i koş-tur-ma-dı.
 -ACC run-CAUS-NEG-PAST.

(i) John did not make Mary run (i.e. she ran on her own accord)

(ii) John made Mary not run (i.e. he prevented her from running)

b. Emine-yi bugün çalış-tır-ma-dı-m.

-ACC today work-CAUS-NEG-PAST-1s

(i) I didn't make Emine work today. (i.e. she might have worked on her own)

(ii) I made Emine not work today. (i.e. I didn't allow her to work)

Mongolian

- (40) Bi: Mari:g güi-lge-sen-gü:.
 -ACC run-CAUS-PAST-NEG

- (i) I did not make Mary run.
 (ii) I made Mary not run.²²

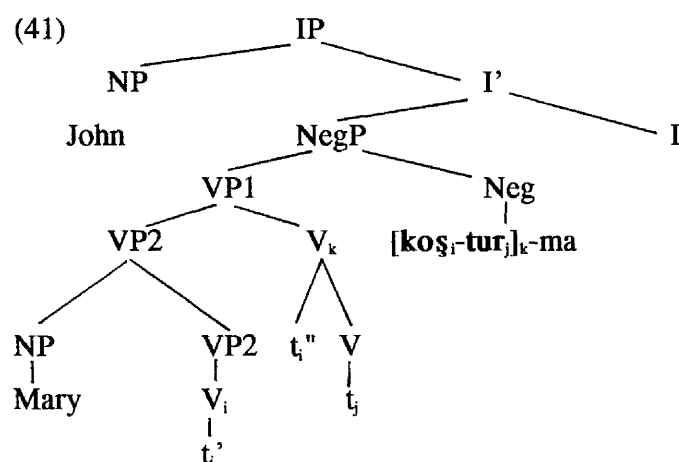
The basic difference between the two interpretations is that one entails that Mary did not run, whereas the other does.

The interpretation which one would represent as [[V]NEG]CAUS] is thus available in Turkish and in Mongolian and ^{accepted}by at least some speakers in Uighur. In fact, it is, apparently, the only interpretation available in some languages, such as Japanese (Shibatani 1976). I will henceforth refer to this interpretation as the narrow scope interpretation of negation.

There are two quite separate problems here. One is of a technical nature and relates to the representation of the narrow scope interpretation of negation in VI structures. The second involves the implications of a mismatch between surface and logical configurations. I will leave the latter to Chapter II and concentrate here on the technical problem.

Let us look at how one might explain the narrow scope interpretation of negation within a VI account of causativity. There are various ways of representing negation within a GB perspective.²³ The only one which seems to be compatible with incorporation, and the one adopted by Li, is representing it within a "split INFL" hypothesis, along the lines suggested in Pollock (1989) for functional elements. In this analysis negation is taken as a head with its own maximal projection NegP.

Taking Li's characterisation of VI first, this analysis allows only one base position for the negative suffix, that immediately dominated by IP in the matrix clause. A NegP in the embedded clause is not an option simply because there is no IP in the lower clause. Generating a position here would constitute an intervening functional head (between V and the causative suffix), a structure which Li sets out to exclude in the first place. Hence, under this proposal, the only possible S-structure representation for the Uighur sentence in (38), the Turkish sentences in (39) and the Mongolian sentence in (40) is one where the negative suffix is higher than the causative suffix.



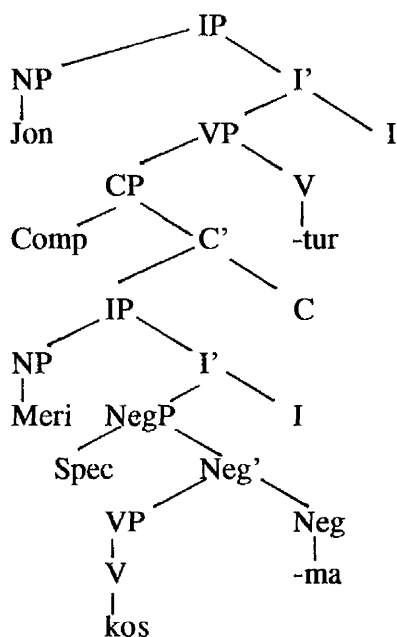
To reiterate, this representation predicts the correct surface ordering of the relevant items (the matrix verb, the causative and the negative), and, again, it correctly rules out the occurrence of any intervening functional elements. However, for the narrow scope interpretation of negation to be satisfied at an LF representation derived from the S-structure configuration in (41), the embedded verb *koʃ* 'run' would have to move back into its D-structure position (the most embedded t_i) and the negative affix would have to move into a position where it c-commands the embedded verb but excludes the causative verb. This would mean the creation of an adjunction structure branching off from a node between VP1 and VP2. However, since this node would have to include a position that is suitable to host a functional head, i.e. Neg, there would be nothing to

debar the occurrence of other functional heads (like I or Agr) in such adjunction structures. This would make incorrect predictions about the structure of causative clauses, since it would allow inflectional elements, as well as agreement morphemes, to have scope over the embedded verb only, excluding the causative. This is unattested in Turkish (see section 4.331). Therefore, within Li's characterisation of VI where the matrix V subcategorises for VP, the narrow scope interpretation of negation cannot be represented.

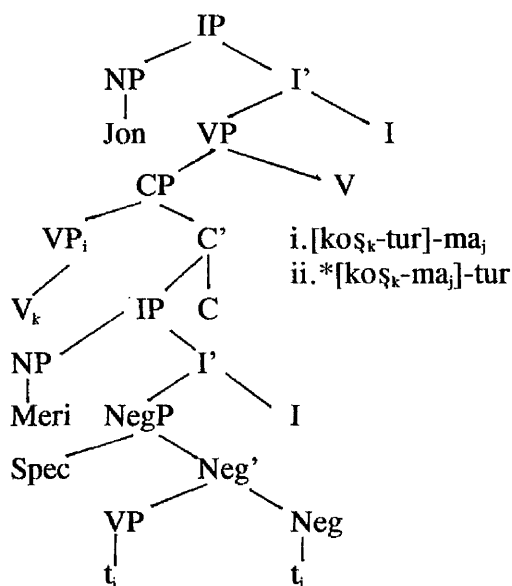
At first glance there seems to be a way of circumventing these problems while still maintaining Li's analysis in some form. In his account of the structure of Turkish negative clauses, Ouhalla (1990b) base generates NegP as a node dominated by TnsP (Tense Phrase) and selecting VP as its complement. In such a characterisation, there is no need for all functional elements to appear since their presence is taken to follow from lexical requirements on complement selection. Such a view would allow the negative element to occur lower than the causative if we were prepared to make a further assumption, namely that the causative head can optionally select NegP. This would raise questions of a more general nature, such as how certain heads (and, in this case quite distinct heads like Tns and a specific V, i.e. the causative) can systematically select NegP or VP. But even assuming that we could get around this problem, there would still be complications created by the movement of the lower VP into the Spec of NegP. Again, as before, there would be no way of predicting the correct order of morphemes at S-structure, unless we imposed an ordering rule on them.

Now consider a Bakerian analysis. Under this proposal, there are two positions where NegP can be base generated: either under the NegP of the matrix clause, or, alternatively, in the embedded clause, since the latter, being a fully-fledged CP, can contain such a position. Consider first the option where NegP is base generated in the embedded clause. (I will be using Turkish sentences as examples, but the same analysis applies to Mongolian):

(42) a. D-Structure



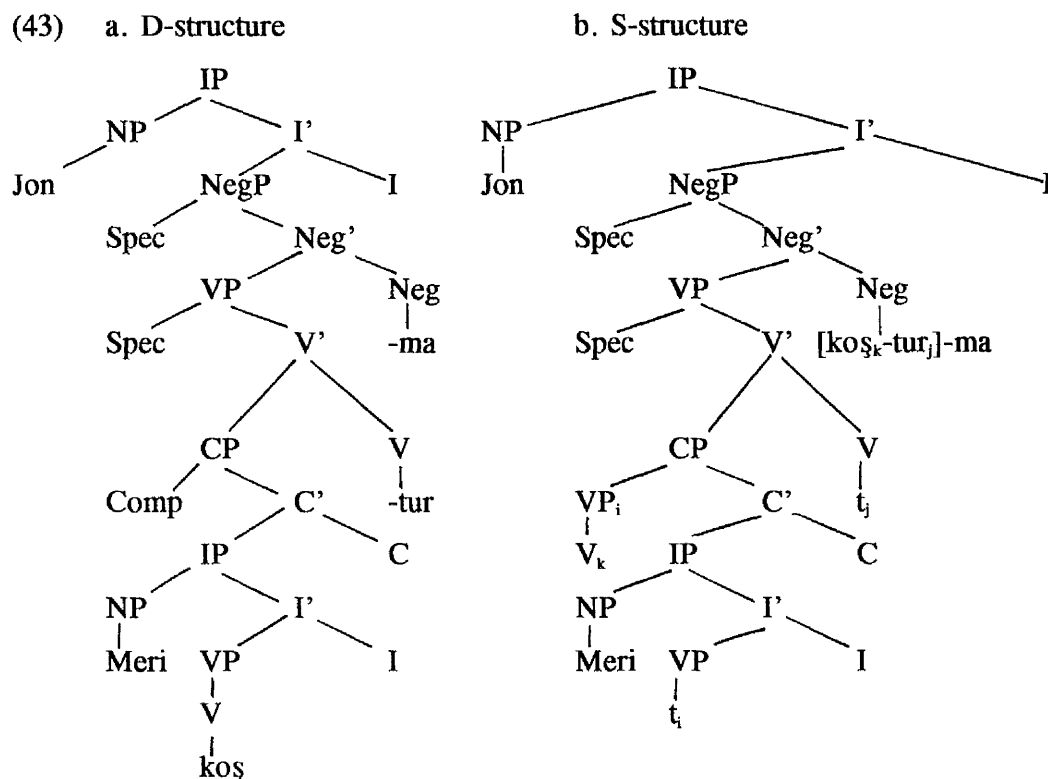
b. S-structure



As can be seen, there are two heads that have to move here: the lower V *koş* 'run' and the negative head. Assuming that VP-to-COMP is the correct analysis for Turkish causatives, the lower VP would have to move through the Spec of NegP to attach to the Comp position. From here the V would incorporate into the causative to form *koş-tur* 'make-run' and then the negative would move through the I and C nodes (or possibly in one fell swoop) to adjoin to the complex verb to form *koş-tur-ma*. Without going any further, we are immediately faced with a problem: What is it that guarantees that head movement obeys an order? Because if it does not, there is nothing to bar the ungrammatical option (ii) in (42b), **koş-ma-tur*, where the negative attaches to the causative first. In order to guarantee that the root verb attaches to the causative before the negative suffix, one would have to apply VP-to-COMP movement first. Taking this step would mean introducing something similar to rule ordering, a move which Baker himself opposes.

The other problem is, of course, how to get the correct interpretation. This would involve both moved heads moving back to their original D-structure positions in order to satisfy scope relations at LF, a factor which not only would necessitate ordered movements of the kind just mentioned but also give rise to an explosion of movements.

The second option is the base generation of negation in the matrix clause:



Although this representation is satisfactory as far as S-structure is concerned, it creates problems similar to those in Li's approach. Here, unlike in Li's analysis, we do have a suitable position for the negative to move into at LF: namely, an adjunction structure in the lower clause.²⁴ However, this alone will not guarantee the narrow scope interpretation of negation, because the structure that is required is one in which the embedded verb is c-commanded by the negation morpheme. To provide such a

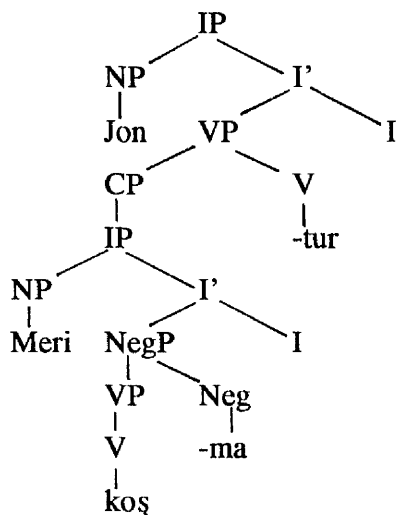
structure, the embedded verb itself will have to move back into its D-structure position, the position that it abandoned in order to satisfy the requirements at S-structure.

Technically, there is no reason why this should not happen; move- α , after all, is a transformation that is allowed unless some constraint debars it. However, we are again not only faced with the problem of elements moving back to their D-structure positions, but we are also forced to stipulate where these elements have to end up. Since there are two possible nodes that can host the negative suffix on the one hand and the root verb on the other, namely I and C, only a stipulation would guarantee that the negative occurs in a higher position at LF than the root verb.

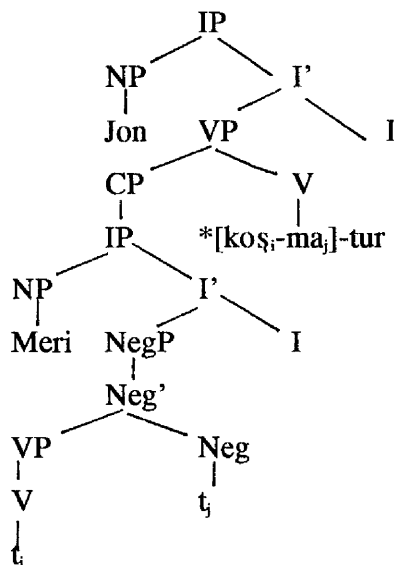
Even if one were to accept such a stipulation, other problems remain. A closer look at the properties of representational levels will reveal that D-structure and LF carry the burden of representing certain semantic properties; thematic structure and scope, respectively. What seems to happen is that, for one set of semantic properties (i.e. thematic structure) to be satisfied, a certain lexical item is assigned a specific position. But on the other hand, it so happens that for another set of semantic properties (i.e. scope) to be satisfied, the same lexical item is assigned the same structural position, but this time at a different level. This is what turns out to be the case when the embedded verb has to move back, at LF, into its original D-structure position. This can be taken as an indication that positing D-structure as a separate level is not warranted.

Allowing ourselves as a last resort a V-to-C analysis for causativity would not help either. In such a case, the following mapping between D-structure and S-structure would emerge:

(44) a. D-structure



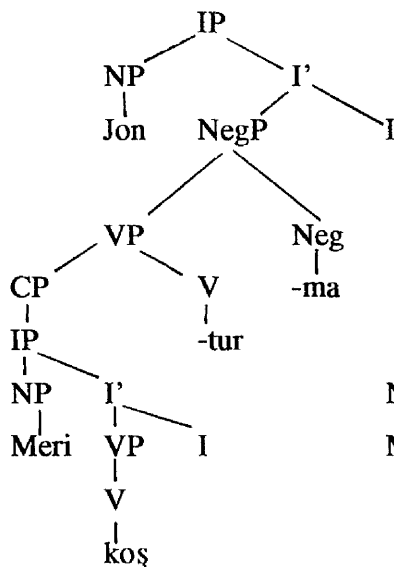
b. S-structure



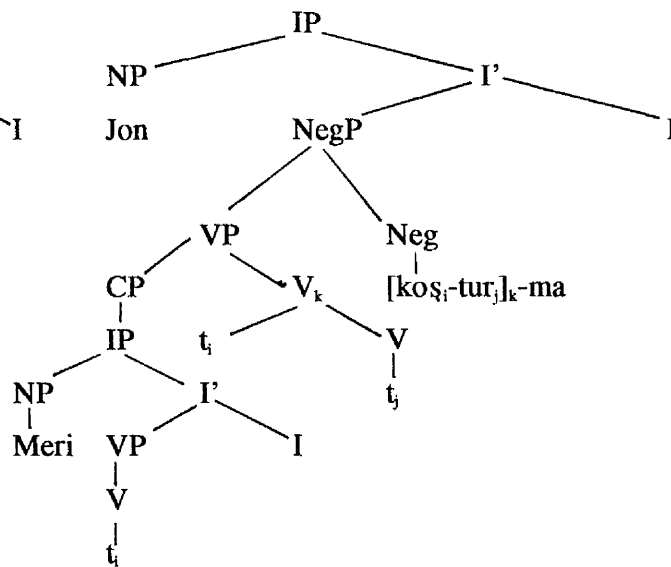
If the negative marker were base generated in the embedded clause, the root verb would first move into this position to incorporate into Neg, and then this *V-NEG* complex would move up to incorporate into the matrix 'cause' verb, as illustrated above in (44b). This would give rise to the sequence in (37), which is ungrammatical. Therefore, a VI strategy cannot be put to work if the negative morpheme is base generated in the lower clause.

If NegP were base generated in the matrix clause, this would yield the mapping illustrated below:

(45) a. D-structure



b. S-structure



The problems created here are similar to those which occur when the negative is base generated in the matrix clause and VP-to-COMP type VI is invoked. This last option rules out the possibility of representing the narrow scope of negation wherever negation is generated and whichever incorporation strategy is adopted.

1.216 The interaction of grammatical function changing affixes and category changing affixes

The final argument against a movement analysis for grammatical function changing affixes involves the interaction of these morphemes with category changing suffixes. It is widely accepted that category changing phenomena are lexical processes, and in this sense occur prior to syntactic processes. This view has been invoked almost unanimously since the early seventies against arguments by generative semanticists claiming that all lexical processes were syntactic. If category changing affixes combine with a word in the lexicon, one would not expect a derivational affix to occur between a stem and a category changing suffix if one were to adopt the view that derivational affixes were combined in the syntax.²⁵ Such a move would entail that a syntactic

process may act as an input to a lexical process, which in turn would jeopardise the descriptive content of both the lexical and the syntactic components.

It turns out that category changing affixes can productively follow grammatical function changing morphemes, examples of which are provided below. Below are a few examples from Turkish and Mongolian:²⁶

The combination of the causative with category changing affixes:

- (46) a. in (descend) + CAUS + NOM → in-dir-im (reduction)
 b. oku (read) + CAUS + NOM → oku-t-man (lector)
 c. gül (laugh) + CAUS + NOM → gül-dür-ü (comedy)
 d. bil (know) + CAUS + NOM → bil-dir-ge/i (declaration)
 e. et (do/make) + CAUS + ADJ → et-tir-gen (causative)
 f. geç (pass) + CAUS + ADJ → geç-ir-gen (permeable)

Mongolian

- g. jav (go) + CAUS + NOM → jav-u:l-?a (action)
 h. san (remember) + CAUS + NOM → san-u:la-g (notice)

The combination of the reflexive with category changing affixes:

- (47) a. gör (see) + REF + NOM → gör-ün-üm (appearance)
 b. gör (see) + REF + NOM → gör-ün-tü (image)
 c. sık (press) + REF + NOM → sık-ın-tı (depression/boredom)
 d. tak (hook) + REF + NOM → tak-ın-tı (obsession)
 e. al (take) + REF + NOM → al-ın-gan (sensitive)
 f. kur (build) + REF + NOM → kur-un-tu (thought)

The combination of the reciprocal with category changing affixes:

- (48) a. gör (see) + REC + NOM → gör-üş-me (meeting)
b. ilet (convey) + REC + NOM → ilet-iş-im (communication)
c. kar (mix) + REC + NOM → kar-ış-ım (mixture)
d. döv (beat) + REC + ADJ → döv-üş-ken (aggressive)
e. gir (enter) + REC + ADJ → gir-iş-ken (sociable)

The combination of the passive with category changing affixes:

- (49) a. öp (kiss) + PASS + ADJ → öp-ül-esi (kissable)
b. yap (make) + PASS + NEG + ADJ → yap-ıl-ma-dık (undone)
c. kat (add) + PASS + NOM → kat-ıl-ım (participation)
d. at (throw) + PASS + NOM → at-ıl-ım (surge)
e. ger (stretch) + PASS + NOM → ger-il-im (tension)
f. oku (call) + PASS + NOM → oku-n-tu (invitation)
g. kal (remain) + PASS + NOM → kal-ın-tı (remnant)
h. al (take) + PASS + NOM → al-ın-tı (quotation)
i. söyle (tell) + PASS + NOM → söyle-n-ti (rumour)

If one assumed, following Baker, that processes like causativisation and passivisation were instantances of incorporation, one would also have to assume that either category changing phenomena were part of the syntactic component, or, that for each causative and passive morpheme, the lexicon contained a pair of representations, one for syntactic processes, the other for pre-syntactic processes.

It is interesting to note that the passive morpheme is more resistant to this kind of word formation process. It has been pointed out (Kageyama 1989) that Japanese does not have an interaction of passive with category changing suffixes, except in a very

limited number of words. What happens is that a verb combines directly with a category changing suffix (an adjectiviser) to produce forms like *te-zukuri no kutu* 'hand make shoes' and *nabe-yaki udon* 'pan-cook noodles' as opposed to **te-rare-zzukuri no kutu* and **nabe-rare-yyaki udon*. This is taken as an evidence in favour of passivisation being a post-lexical process and therefore not expected to interact with lexical processes. However, Kageyama himself mentions "a handful of exceptions" like *izime-rare-kko* 'a bullied child' which contains the passive affix, as opposed to *izime-kko* 'a bullying child, a bully'. He regards the forms that contain the passive suffix to be "ad hoc coinages". It is, in fact, precisely such words which can shed light on the nature of grammatical function changing affixes. The non-existence of forms like **te-rare-zzukuri* and **nabe-rare-yyaki*, has a natural explanation considering the world knowledge we have about the content of its parts, namely 'hands', 'shoes' and 'making'. Since there is only one way of interpreting a form like 'hand-make shoes' (based on our general knowledge of a world in which shoes cannot make hands), the presence of the passive is rendered redundant. It is in those cases where ambiguity may arise that the passive is brought into play, and these are the forms which give evidence for the status of grammatical function changing affixes in Japanese, even though they may be in the minority.

It might be interesting to note that the suppression of the passive morpheme is not unique to the examples cited from Japanese. Cases are reported of passive suffixes being reanalysed as active transitives (Cook 1978). Lawler (1977) points out that the passive gets suppressed in Achanese. In Ecuadorian Quechua, it is reported by Muysken (1981a) that the suffix *-ri* which forms middle constructions cannot be present with the causative suffix although the interpretation of the sequence has a passive sense. Similar claims have been made for Turkish (Zimmer 1976). This point will be taken up in section 6.212 in more detail, where we shall illustrate that the non-occurrence of the passive in certain circumstances follows from its lexical specification and properties of the accusative case marker.

1.3 Conclusion

In the previous section I showed some difficulties which arise if one explains the structure of grammatical function changing processes using a biclausal analysis. It was pointed out that the kind of analysis Baker proposes fails to capture the range of grammatical structures in languages, as well as leading to inconsistencies within its own system. These problems, I have argued, are not merely peripheral problems but are linked to major issues concerning the descriptive power of levels of representations, calling the validity of these levels into question.

Baker's is only one of the analyses that aims at analysing grammatical function changing phenomena. An increase in the study of morphologically rich languages has forced researchers to investigate the interaction between morphology and syntax. Some of these models have a lexical component with a more complex structure, enriched either in terms of the levels it contains (Zubizarreta 1987) or in terms of lexical properties (Marantz 1984, Bresnan 1982).²⁷ Other models deal with the problems by redefining the levels onto which lexical properties are projected (Borer 1991, Hale 1983, 1989, Sadock 1985, 1987). In terms of the way in which they analyse causatives with respect to levels of representation, these analyses can be categorised as follows:

- (i) analyses which propose that morphological causatives are formed in the lexicon by word formation processes, and have monoclausal structure throughout (Silva-Corvalán 1978, Aissen and Hankamer 1980, Bresnan 1982, Dede 1984, Knecht 1982)
- (ii) analyses which claim that morphological causatives are biclausal at an underlying syntactic level, but are monoclausal at the surface level (Knecht 1985, Özkaragöz 1986b)
- (iii) analyses which assign morphological causatives to two separate components, with a mapping procedure between them, these two being the lexical and syntactic components in the case of Zubizarreta (1987), the logical and syntactic components in the case of Lapointe (1987), and the lexical (morphological) and semantic components in the case of Sadock (1991).

(iv) analyses where the morphological causative is assigned biclausal structure both at an underlying level and at the surface (Baker 1988).

It is obvious that summarising disparate models in such a way hardly gives them the credit they deserve.²⁸ An altogether different work would emerge were one to investigate them in depth. However, due to limitations of the scope of the present work, I will only to these models only when specific points need to be elaborated.

What we shall be exploring instead is the possibility of a model which does not require several levels of representation but derives the necessary complexity of grammatical function changing phenomena from lexical specifications which serve as input to a logic. This chapter has been devoted to arguments against one of the levels of representation, D-structure, and one of the immediate consequences of the criticism presented here is the abandonment of D-structure as a level of representation.²⁹ In the following chapters I shall look at the status of a syntax-internal level of logical form and from there I shall move on to characterising complex predicates within a reformulated understanding of grammar as part of reasoning.

NOTES

1. This is not an exhaustive list of the causative suffixes in Turkish. See section 4.23 for the full paradigm.
2. The rigidity in the ordering of grammatical function changing affixes appears to be predicted by the Mirror Principle (Baker 1985). However, I will argue in 7.24 that the Mirror Principle not only lacks the explanatory power of a principle, but is also descriptively inadequate, given the counterexamples languages provide.
3. The negative suffix is the point at which the descriptive power of the terms "derivational" and "inflectional" breaks down. It appears to resemble standard derivational morphemes with its contribution to a change in meaning, while in other respects it behaves like inflectional morphemes. Since this work is not about the classification of morphemes, I will not pursue this matter here.
4. See Erguvanlı (1984) for the surface positions of these elements.
5. Kageyama (1982) argues along lines similar to Borer. These approaches share the assumption that word formation is not a process that takes place prior to syntax but interacts with D-structure and S-structure in the case of Borer, and possibly with LF in the case of Kageyama.
6. More recently there have been suggestions that word formation should be characterised in terms of the notions of inheritance and feature percolation (see Lieber 1992 and references therein). The latter is relevant to inflectional morphology, but the former is articulated as a mechanism which guarantees that the output of the combination of a stem with a derivational affix produces a node which inherits the features of the head; this is usually the derivational affix.
7. D-structure occupied a central position in syntactic theory towards the end of the 1970's. The question as to whether the base should generate S-structures directly or whether there should be an underlying level of D-structure was left open as an empirical issue with no methodological considerations in earlier work (cf. Chomsky 1977). Later,

in Chomsky (1980), it was suggested that idioms provided evidence for the postulation of D-structure as an independent level.

8. The principle based aspect is what Baker's analysis apart from earlier rule-oriented approaches. In fact, the reasoning behind Baker's views is, in some ways, very similar to Generative Semantics (cf. Lakoff 1976, and Dowty 1976 for an application of the insights of Generative Semantics to formal semantics), except than in Baker's case, only morphologically complex predicates have underlying complex structures. (Also the underlying structure in Generative Semantics is not D-structure per se.) But a technically very similar analysis to incorporation is "predicate raising" proposed by Aissen 1975, 1979, Kayne 1975 and later by Borer 1984 and Burzio 1986, among others. Morphological causatives in these works are treated as an instance of fronting the causative predicate, similar in spirit to verb incorporation, although different in the sense that whereas one is derived from independent principles, the other is stated as a rule.

9. The abbreviations in the examples taken from other sources are retained, although this might, at times, lead to separate abbreviations for the same morpheme.

10. See Baker 1988, p. 46.

11. The question of whether the Head Movement Constraint (HMC) should be subsumed under the ECP, which is discussed at length by Baker, does not affect the issues discussed here. See Ouhalla 1989, 1990a for relevant arguments.

12. Li 1990 argues that neither C nor I are similar enough to V for it to move into (or through) these heads, hence such movement should be ruled out. Altering VI such that it becomes consistent with this claim does not affect my analysis, so I shall not pursue this point here.

13. For an evaluation of the government properties of the complex verb see Sadock 1990.

14. A similar phenomenon known as "excorporation", the movement of a head through

another head, is allowed in some analyses. See Guasti 1991.

15. Some researchers extend the transposition of morphology into a syntactic component by attributing negative-bar level head status (X^{-1}) to lexical items, a suggestion originating in Selkirk 1982. For the application of this proposal to head movement see Roberts 1991a.

16. See Baker 1988 p. 177 for details.

17. The fact that there are no barriers hinges on a redefinition of barrierhood based on the notion of "distinctness", where X and Y are distinct if "no part of Y is a member of a (movement) chain containing X". For details, see Baker (1988) pp. 64-68. Under this definition, there are no barriers because none of the phrasal categories CP, IP or VP selects a head which is distinct from the complex V. The heads of the above mentioned categories become part of V as a result of incorporation.

18. See Kimenyi 1980.

19. It is interesting to note that languages can have a case marker specifically reserved for marking the causee. A case in point is Gilyak (Comrie 1976):

- (i) N'i Xevgun erx qala-gu-d'
at him hate-CAUS

I made Xevgun hate him.

where *-erx* marks the causee when it is animate. It is difficult to envisage the presence of a case marker reserved for causative constructions in an account like incorporation which does not attribute a special status to the causative morpheme.

20. In fact, two native speakers of Uighur whom I have consulted accept both interpretations. Considering that one sense of the causative affix is 'let', the truth conditions which negate the only embedded verb follow naturally.

21. The original example given by Bainbridge (1987) is the following:

- (i) Ipana Diş Macunu dişleriniz-i çürü-t-me-z.

Ipana toothpaste your teeth-ACC rot-CAUS-NEG-AOR

Ipana toothpaste does not let your teeth rot.

where we can interpret the "permissivity" reading as [CAUS[NEG[V]]]. Bainbridge correctly observes that (i) does not mean 'Ipana toothpaste does not make your teeth rot'. Otherwise it has to be based on the false assumption that toothpastes are normally expected to make one's teeth rot.

22. The interpretation in (40ii) becomes more transparent in the sentence below:

(i) Bi: Mari:g güi-lge-sen-gü: baij çad-san-gü:.

I -ACC run-CAUS-PAST-NEG be able-PAST-NEG

I did not make Mary run, I was not able to stop her. (i.e. she is running of her own accord.)

23. The negative is generally analysed either as a head base generated under NegP, or as an adjunction. Rizzi (1990), for example claims that it is in the Spec of T(ense) P(hrase). See also Zanuttini (1989) and Haegemann and Zanuttini (1991) for the position of NEG in "negative chain" constructions. It is not clear how these analyses could be extended to cover morphological negatives at this stage.

24. The details of the exact location are not relevant to the analysis here. It can either move to C or to I, both of which are empty and c-commanded by the causative verb.

25. Another view is that some affixes like the adverbial forming *-ly* in English (Larson 1987) and the passive affix in Greek (Tsimpli 1989) can attach either in the lexicon or in the syntactic component, yielding distinct results. Such mechanisms are not necessary in the analysis we shall be giving.

26. Similar forms are present in Bantu languages (Alsina 1990, Matsinhe 1991). See also Rice (1985) for the occurrence of the nominal marker after an inflectional morpheme in Slave and Davis (1980) for a similar case involving the passive in Sliammon.

27. More recently, Alsina (1992) has suggested that the causative affix should be analysed as a three-place predicate in some languages, based on evidence from a number of languages in the Bantu family. According to this analysis, thematic-structural hierarchy is taken as a primitive and the causative suffix induces a merger between two

thematic roles. In section 4.31 we shall argue that there is no motivation for analysing the causative as a three-place predicate in Turkish.

28. There are many works which question the existence of D-structure from different points of view among which are Hudson (1976 and later work), Koster (1987), and Wasow (1977), as well as works written in the GPSG framework, which we shall not be able to evaluate here.

29. I do not wish to give the impression that there is a unitary notion of D-structure within GB. For example Speas (1990) takes D-structure to be a pure representation of thematic structure only, while Brody (1985) argues that D-structure is a derived level where the root positions of chains are represented, a characterisation which he suggests in Brody (1991) as an alternative to the Speas position.

CHAPTER II

INTRODUCTION TO THE REPRESENTATION OF COMPLEX PREDICATES

2.1 Introduction

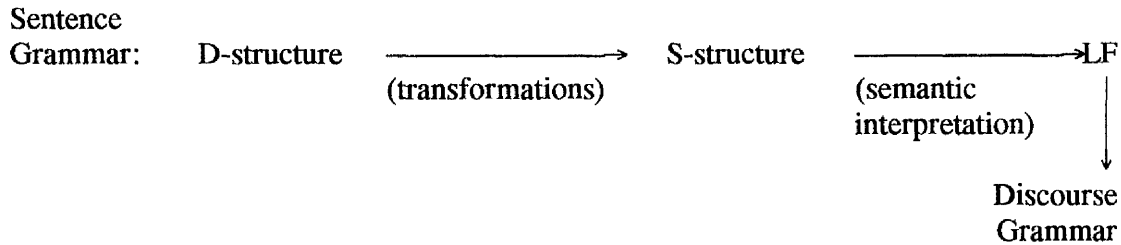
The aim of this chapter is to outline a grammatical model which will accommodate the representation of complex predicates and argument structure without running into the problems mentioned in Chapter I. There I showed the complications arising from positing an underlying D-structure representation for causative constructions, and suggested that abandoning this level would be advantageous for a number of reasons. Taking this suggestion seriously can lead us to a number of conclusions differing in various degrees from standard assumptions about the structure of grammar. The most conservative approach would be to have a D-structure-less grammar with S-structure and LF as the only levels of representation. Abandoning D-structure could also be interpreted as a first step towards a mono-stratal grammar with a surface syntax and a separate component representing semantic/logical properties. A more radical conclusion would, of course, be a shift towards a complete re-evaluation of the levels of representation and of the grammar.

The route I shall pursue in laying out the properties of a new grammatical model will reflect a gradual move from the more conservative approach to the more radical one. After a preliminary section outlining some of the views concerning the status of levels of representation and the interaction of separate grammatical components, the nature of the S-structure/L(ogical) F(orm) relation will be questioned. In particular, by exemplifying with bracketing paradoxes in Turkish nominal compounds in section 2.111, I will demonstrate that LF, the level which is understood as capturing "logical form", presents problems with no immediate solution when articulated as part of a syntactic representation, and fails to capture the mismatches languages display. Taken together with arguments brought against D-structure in the first chapter, it will be claimed that the representation of certain semantic and logical aspects of linguistic

content calls for a distinct level which is directly projected from the lexicon. Probing the derivational linkage between the levels will form the basis for understanding the interaction not only of S-structure and LF, but more importantly, of the notions of syntax and logical form. Section 2.2 which is an outline of Licensing Grammar (Kempson 1990) queries how much of linguistic content can be captured when linguistic mismatches are attributed solely to the interplay of discrete systems, and I shall consider whether this stance achieves the desired goal. In the exposition of Licensing Grammar I will first outline the underpinnings of this model in section 2.21. I will then lay out the formal properties of the model in section 2.22. Here I will provide an analysis of nominal compounds in the proposed model as well as a preliminary analysis of causatives, passives and reflexives. As will be explained in section 2.3, the level of Logical Form in Licensing Grammar still lacks the flexibility and mechanisms of explicitly representing certain aspects of these constructions. This will lead to a further redefinition of the levels of representations and components of grammatical description forcing a shift to the more radical position of defining grammar as a system interacting dynamically with processes of reasoning.

2.11 Preliminaries

Syntax, semantics and pragmatics have generally been seen as distinct aspects of linguistic expressions and their interpretation, with syntax formalising the structural properties of sentences, semantics attributing a model-theoretic interpretation to these structures and pragmatics providing an explanation of how specific interpretations are selected in context. A case in point is the analysis of anaphora in current syntactic frameworks stating the potential for interpretation of a reflexive or a pronoun in terms of a structurally defined relationship between these anaphoric expression and a possible referent, the exact reference only being assigned by pragmatics. The stepwise fashion in which syntactic structures, semantic representations and pragmatic processes have been assumed to take place can best be illustrated by a diagram from an earlier work of Williams (1977):



where rules of Discourse Grammar are understood to apply to logical forms, these latter being defined by the rules of Sentence Grammar. Rules of Discourse Grammar apply in domains larger than the sentence (i.e. in discourse) and semantic rules are taken to apply to S-structure.

In this chapter I shall argue that linguistic expressions can best be explained within a grammar which characterises syntax, semantics and pragmatics as dynamically interacting processes rather than one providing the input for the other. This will be possible once lexical content is assumed to provide all types of information concurrently. The starting point will be the analysis of certain properties of logical representations, and I shall specifically probe the status of a logical representation as a syntactic derivative of S-structure. I shall therefore look at the properties of GB-style Logical Form which is the most explicitly articulated version of such a position.

2.111 The status of a syntax-internal level of logical representation

LF as a syntactic level in the GB paradigm is derived from S-structure representations by means of the general application of the rule *move- α* , the rule that maps D-structure onto S-structure. Originally, the motivation for a level of LF was based on the representation of quantification, reference, focus and scope, in line with more general suggestions made by Chomsky (1975). The formal characterisation of LF as a separate level was put forward by May in his dissertation and later in May (1985), where he argued for the application of *move- α* to quantified expressions. Movement is thus generalised to include aspects of interpretation, and consolidates the presence of LF as a derived level.^{1 2} Here I shall take the view that a direct mapping from S-structure

onto LF is too restricted a mechanism, and cannot account for the diversity of natural language. The technical drawbacks of such a mechanism have already been addressed with respect to the representation of negation in section 1.215. There it was pointed out that the representation of the narrow scope interpretation of negation under an account of incorporation meant moving an element (the negative affix) back to its base (D-structure) position, only to satisfy scope requirements. Such a move is undesirable if one is committed to economy of derivations being a guiding force in the search for the most adequate grammar.³

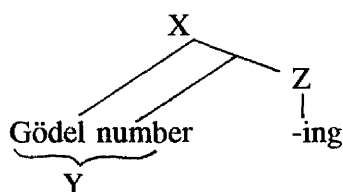
The constructions which pose a problem for a mapping between S-structure and LF are those which display the effects of so-called bracketing paradoxes. Below I shall look at the nominal compound construction in Turkish and its paradoxical structure. Before going into the properties of Turkish nominal compounds however, an exposition of bracketing paradoxes is in order.

2.1111 Bracketing Paradoxes

A certain peculiarity in the compositional properties of nominals was observed by Williams (1981b). Williams noted that certain nominals display a mismatch between the ordering in which morphological concatenation takes place on the one hand, and semantic compositionality requirements on the other. One of the examples he gives is the compound *Gödel numbering*. Under the assumption that affix ordering should precede the process of compound formation,⁴ *-ing* would have to attach to *number* before the compound was formed. By contrast, following the principle of semantic compositionality whereby the meaning of the whole unit is a function of the meaning of the parts, the combination of *Gödel* and *number* should take place before the concatenation of the affix, otherwise the semantic link between *Gödel number* and *Gödel numbering* would be lost. This would lead to a paradox created by the cooccurrence of two conflicting combination requirements. Williams' suggestion regarding the resolution of such paradoxes is the substitution of the requirement on compositionality by a

requirement on "lexical relatedness". He argues on the basis of compounds such as *push up* and *run down* that compounds may lack heads and should therefore be allowed to be derived by headless rules which are not branching. *Push up* has the structure [_N _{VP} _{up}]_N showing that it is possible to have headless elements, otherwise two distinct categories would not be able to combine to give rise to a third type of category. The existence of such exocentric elements are taken as evidence that compositionality is not a requirement in compound formation. Instead, compounds are claimed to be related to one of their parts lexically. What this means is that a compound such as *Gödel numbering* is not linked to *Gödel number* through semantic compositionality where the former is derived from the latter, but rather through lexical relatedness which allows the former to be broken down into the latter. The mechanism which guarantees the link is the removal of the head, this being allowed if two compounds differ only with respect to a head. Here the head is *-ing*, the removal of which leaves *Gödel number* as the related subpart, illustrated below:

(1)



The removal of Z allows for stating an identity between X and Y.

Relatedness is a notion which involves mechanisms that map one lexical or phrasal unit onto another, rather than deriving one from the other by the addition of new elements.⁵ Although this is structurally viable, maybe even preferable, it is not altogether clear how the shared meaning between two compounds is captured. Considering that the mapping procedure may also involve the removal of non-heads, it seems to be a descriptive device, rather than one which aims at capturing the semantic affinity between two forms.

It was probably similar concerns regarding the abandonment of compositionality which led researchers to seek alternative explanations. One of the ways of looking at the problem turned on a mismatch between two levels of representation, with one level being derived from the other (basic) level. Among the advocates of this view are Pesetsky (1985), Kitagawa (1986) and Cohn (1989). Kitagawa (1986) claims the well-formedness conditions at the phonological level reflect the well-formedness conditions of D-Structure and S-structure, with LF being the derivative level. Cohn (1989) considers semantic compositionality and subcategorisation as dictating the primal bracketing from ^{which} the phonological bracketing is then derived. Here I shall focus mainly on Pesetsky's analysis with a view to understanding the mechanisms involved in derivational approaches.

Pesetsky based his arguments on non-parallel compositionality requirements imposed by a phonological level and a logical level and exemplified his claims by comparative adjectives like *unhappier*.⁶ Since the comparative suffix in English can only be attached to words that contain at most two syllables, *-er* seems to attach to *happy* first, and not to *unhappy*, by the requirements of phonology:

(2) [un [happy + er]]

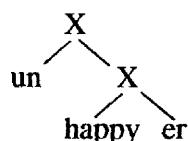
The translation of (2) into semantic terms yields *not happier* (i.e. not [more happy]). But *unhappier* does not mean [not [more happy]]; it means [more [not happy]] (i.e. 'more unhappy'). Therefore, the representation that is needed for the purposes of semantic combination is:

(3) [[un + happy]er]

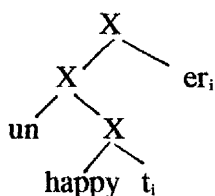
Problems created by the mismatch of (2) and (3) led Pesetsky to posit two levels of representation in morphology, one respecting rules of phonology, the other respecting

rules of semantics. The level where semantic combination was argued to take place was the latter, a direct analogue of the syntactic level of LF. The mapping between these levels was then characterised by a movement rule parallel to Q(uantifier) R(aising), the movement of a quantifier at LF for purposes of the interpretation of scope. So an element in a phonological representation (here *-er*) is analysed as moving to its position at LF where the required scope relations are satisfied, leaving behind a trace:

(4) a. Phonological Representation



b. LF Representation



Thus Pesetsky, unlike Baker, did not carry morphological concatenations into syntax as explained in Chapter I, but imported properties defined for syntax into morphology, with similar results. Such a move, as Pesetsky himself observes, makes it even more difficult to understand the content of the lexicon. On this view, lexical items would have to be listed according to their phonological concatenation properties requiring a lexicon internal logical level for their semantic properties. Even if one were to accept more than one discrete level of representation in morphology, it would still be difficult to circumvent other problems that would arise from this move. Several questions immediately come to mind. The first is whether an account of hierarchies in morphology would lead to postulating "X' morphology". For example, although the notion of 'head of a word' may exist following Williams (1981b), would this have to force a notion of a specifier position within a word? If there are no such specifier positions then the assumptions of the X' system are not carried over unchanged to the domain of morphology. If, on the contrary specifier positions exist word internally, would movement have to follow the same lines as it does in syntax? Are there discrete processes of head and specifier movement as in syntax?

A second related problem is the status of empty categories. Since word-internal affix movement would be local, there would presumably be no ECP violations, at least in the version that Pesetsky proposes. If there can be no ECP violations word internal movement at LF should totally be free. But this is not the case as we have seen with the scope of negation in Uighur (cf. section 1.215). This raises the question as to how far one should carry the morphology/syntax analogy.

Thirdly, as pointed out by Hoeksema (1987), quantifier raising in syntax is motivated by scope ambiguities. These morphological paradoxes not only lack scope ambiguities, but the interpretations predicted by phonological requirements are the reverse of the intended interpretations. Hence copying mechanisms used for quantifier raising may actually obscure processes at play in word and compound formation, which suggests that morphological processes do not lend themselves to an intra-level derivational approach.⁷ Moreover, there seem to be theory internal issues which require explanations. Lieber (1992) argues that the trace left behind, although c-commanded, is not properly governed because of an intervening barrier. The details of this analysis are not relevant here. What is important is that following Booij and Rubach (1984) Lieber suggests that bracketing paradoxes have to be allowed to refer simultaneously to two discrete structures, one morphological and the other prosodic, with no mapping in between. From this Lieber concludes that there are no apparent paradoxes. The analysis which I shall propose will be similar to Lieber's in attributing bracketing paradoxes to two discrete systems; however playing down the non-isomorphy only serves to obscure a much more significant issue: that natural language systematically displays a convergence of discrete systems. Bracketing paradoxes present one piece of evidence that forces us to address this issue.⁸

Turning now to Turkish, nominal compounds in this language display combination mismatches in the interaction of the nominal compound marker *-si* with either *-ler* (plural marker), *-lik* (a suffix forming nouns from nouns and adjectives), or -

ci (profession marker). Here I will only demonstrate the interaction of the nominal compound marker with the plural suffix, first pointed out as displaying bracketing paradoxes in Hankamer (1987). The problem is more or less the same when the nominal compound marker interacts with the other two suffixes *-lik* and *-ci* (Göksel 1988).⁹

Nominal compounds are made up of two nouns rigidly ordered with respect to one another, with the nominal compound marker attached to the second noun:

- (5) a. otobüs bilet-i
 bus ticket-NC
 a/the bus ticket
- b. biber dolma-sı
 pepper stuff(ed)-NC
 a/the stuffed pepper

When these forms are pluralised, contrary to expectation, the plural marker does not follow the nominal compound marker but precedes it:

- (6) a. otobüs bilet-ler-i (*otobüs bilet-i-ler)
 bus ticket-PL-NC
 bus tickets
- b. biber dolma-lar-ı (*biber dolma-sı-lar)
 pepper stuff(ed)-PL-NC
 stuffed peppers

This phenomenon does not only occur in compounds which are semantically compositional, but may also occur in idiomatic ones:

-
- (7) a. *deve-kus-u*
 camel-bird-NC
 ostrich
 b. *deve-kus-lar-ı* (**deve-kus-u-lar*)
- (8) a. *köpek-dis-i*
 dog-tooth-NC
 canine (tooth)
 b. *köpek-dis-ler-i* (**köpek-dişi-ler*)
- (9) a. *kasım-pat-ı*
 November-aster-NC
 chrysanthemum
 b. *kasım-pat-lar-ı* (?*kasım-pat-ı-lar*)¹⁰

To summarise, nominal compounds in Turkish display a discrepancy between the surface (phonological) ordering of the morphemes and requirements of semantic compositionality. The technicalities involved in this problem are just a reflex of an underlying problem relating to the nature of the non-isomorphism between structures assigned to surface sequences and their logical structure corresponding to these sequences. I shall take such constructions as an indication that constructs of natural language syntax and those of logic belong to distinct but interacting systems, and that there is no reason to force a trivial mapping from one system to the other.^{11 12} An alternative analysis of bracketing paradoxes will be sketched out in section 2.231.

2.2 Licensing Grammar

2.21 Background

Licensing Grammar purports to be a model of language as an input system. It is designed to reflect the Fodorian notion of the Language of Thought (Fodor 1975, 1983)

and the Sperber and Wilson account of natural language in which the linguistic content of natural language expressions underdetermines interpretation (Sperber and Wilson 1986). Fodor takes a somewhat different view of modularity to that espoused by Chomsky. In the work of the latter (cf. Chomsky 1986a, 1991a,b) the language faculty is understood as having a modular structure in the sense that it embodies specific processes. It contains sub-modules which are defined in terms of principles uniquely characteristic of those sub-modules, and with no correlate in any other part of the cognitive network. (For example the projection principle, or the theta criterion are relevant to the language faculty only.) Chomsky takes the language faculty to be just one of the modules among others such as the faculty for theory formation, the music faculty (Chomsky 1986a) and even the moral faculty (Chomsky 1989). Whether these other faculties each have a specific and autonomous structure is not clear. But what is certain is that the language faculty has a characterisation independent of logic. It is stated in Chomsky 1975 that "it is our ignorance of syntax that makes plausible the belief that grammar is nothing but applied logic". He argues that there is no contradiction in attributing autonomous structure to a grammar and accepting the view that the "actual system of grammar" cannot be determined in isolation from questions of fact and belief. In this sense, he accepts the interaction of grammar with other (cognitive) structures, but does so strictly in terms of the order of input. That is, he supports the view that logical form is part of the syntactic component derived from properties of D-structure and S-structure, and takes this structure to be the input to "Semantic Representation" (SR) which involves beliefs, expectations and other cognitive processes. This stance is in line with theories that take syntax to be the input to semantic characterisations. These views are iterated in later work (Chomsky 1991a), in particular with respect to the relation between rules that form I-language and other faculties of the mind, especially the conceptual systems.

Fodor (1983, 1987) has a different understanding of modularity. According to Fodor, the language faculty, rather than sharing certain properties with faculties and

belief formation, is similar to input systems such as the visual system and the auditory system. Attributing a structure to the language faculty which resembles that of the input systems implies that it is impenetrable with respect to the output of other systems, similar to what Chomsky claims, with the difference being the shallowness of the output of the language faculty. It is shallow in the sense that what is perceived as having grammatical structure has to interact with other aspects of the central cognitive system (such as memory, hypothesis formation and deduction) in order to be interpreted. The properties which Fodor argues constitute the similarity between the language faculty and the input systems are the following: they are encapsulated, modular, automatic, fast and shallow in output. They are encapsulated because they are impenetrable by central systems; modular because they uniquely define the mode of their input and cannot process information in a different format; automatic because they blindly perceive whatever information is provided in the format they can recognise; fast in terms of on-line processing (unlike, for example, belief systems and hypothesis formation); and shallow because they only provide the basic input to a process which involves other cognitive processes such as deduction. Our main concern here is not the comparison of the language input system to other input systems, but whether the language faculty can possibly interact with other cognitive mechanisms, and what properties a grammar will have once we consider this a possibility.

Although acknowledging the role of hypothesis formation and disconfirmation as part of the process of utterance interpretation, Fodor claims that there is no possible theory of central cognitive processes which might help understand the constraints on interpreting the output of perceptual systems (cf. Fodor 1983, 1989). The contribution of Sperber and Wilson (1986) is to suggest that the constraints which operate to ensure success in interpreting utterances can be characterised. They argue that utterance interpretation involves two tasks. One of these is to recover the proposition expressed from a sentence whose linguistic content underdetermines that interpretation. The other task is to construct a context which, when combined with this proposition expressed,

gives rise to implicatures and other pragmatic effects. This two-fold task is tightly constrained by a cognitive mechanism called the principle of relevance. According to Sperber and Wilson, the hearer aims at achieving the most "cost-effective" interpretation, guided by the in-built knowledge that the speaker would also aim at such an interpretation. Cost-effectiveness is defined in terms of minimal effort for maximal contextual implications, hence the aim underlying communication is, by hypothesis, the effort to achieve optimal relevance. In a communicative situation, from the input provided by the linguistic content, a hearer forms a hypothesis regarding the propositional form of the utterance which is optimally relevant. Quite explicit in relevance theory is the claim that linguistic content underdetermines the full propositional form of utterances. It is not only the resolution of all anaphoric dependencies that requires general reasoning and the formation of a context, non-anaphoric expressions too are systematically subject to the filter of relevance for the assignment of an interpretation. In all cases, the first interpretation that the hearer recovers is presumed to be the correct (and only) interpretation the speaker could have intended since if it gives rise to adequate inferential effects, it is also the one which imposes the least cognitive effort. The effect of the principle of relevance is a least effort principle, and every structure building process involved in utterance interpretation is predicted to be minimal.

Along these general lines, Relevance Theory provides an explanation for the process of enrichment in terms of deriving a propositional form from an incomplete logical form. Similarly, it explains how implicatures are formed in a communicative process. The explanation of the context-dependent nature of utterance interpretation stands in contrast to accounts of context-dependence in formal semantics. In particular, the relevance theoretic approach involves the building of structured representations of a logic, whether it be as a representation of explicitly intended content or as a representation of context.

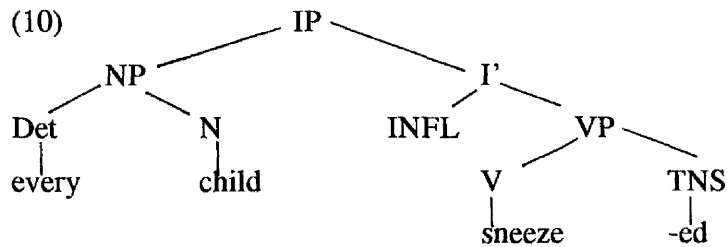
One of the main purposes of Licensing Grammar is to provide a model of linguistic knowledge which captures these processes involved in utterance interpretation. Part of the aim of constructing a model of a grammar as an input system is to provide a framework that represents the underdetermined nature of pronouns and other anaphoric expressions. Anaphoric expressions systematically correspond to diverse interpretations such as bound variable, coreferential and "lazy" readings (cf. Kempson 1988a), and the aim is to capture this diversity as an enrichment process operating on a single lexical input provided by the pronominal. The motivation behind this is the observation that pragmatic processes freely interact with syntactic restrictions imposed on pronominal reference, this being a phenomenon which is standardly characterised as being internal to the grammar. There is thus a dual commitment to a representational account of interpretation and to reconstructing the underdeterminacy intrinsic to lexical specifications as in the case of pronominals. This results in a unitary and pragmatic account of pronominal interpretation in which interpretation turns out to be the selection and/or the construction of the appropriate representation at Logical Form.

2.22 Outline of Licensing Grammar

Reflecting the spirit of the Fodorian notion of grammar as an input system, this model has two levels which are the artefacts of two different systems, each with its own vocabulary. The level where natural language syntax is represented, I shall call Surface Form (as opposed to S-structure) in order to avoid confusion. The other level is Logical Form (not to be confused with LF, a GB structure of the logical form of linguistic expressions), this being a Language of Thought construct. Both levels are projected from a lexicon which provides information relevant to these levels. The restrictions this model imposes on the interpretation of linguistic expressions are as follows:

- (i) restrictions on the well-formedness of Surface Forms
- (ii) restrictions on the well-formedness of Logical Forms
- (iii) restrictions on enrichment, a pragmatic process involved in mapping Surface Forms onto Logical Forms

The restrictions in (i) are expressed in familiar c-selection terms, assuming an X' hierarchy and standard syntactic vocabulary. Those in (ii) are expressed as logical type specifications as in PTQ (Dowty, Wall and Peters 1981). These logical type specifications articulate the logical combinatorial properties of expressions and in this way induce a logical structure. The building of this structure is the output of the interaction between syntactic (i.e. configurational) constraints and pragmatic processes. (iii) is thus a pragmatic process and involves the implementation of the principle of relevance which is itself a least effort principle. It is exemplified by the locality restrictions associated with anaphoric dependencies which are lexically listed but which are implemented pragmatically. The notion of grammaticality turns out to be a dual specification imposed on sentences: a sentence is grammatical iff it meets the wellformedness conditions internal to the grammar, and from this construction it is possible to form at least one well formed formula of the language of thought. It is crucial to understand that although both representations are constructed via lexical specifications relevant to those levels only, the mapping between surface constructions and logical configurations conforms to the least effort principle in the formation of adjunction structures. Before looking at various aspects of this model in more detail I would like to give a preliminary introduction to its basic mechanisms. The model is best displayed by taking a sentence containing a quantified expression, such as *Every child sneezed*. In line with requirements on Surface Form, the string has a surface representation given below, induced directly from the lexical specifications of its parts:



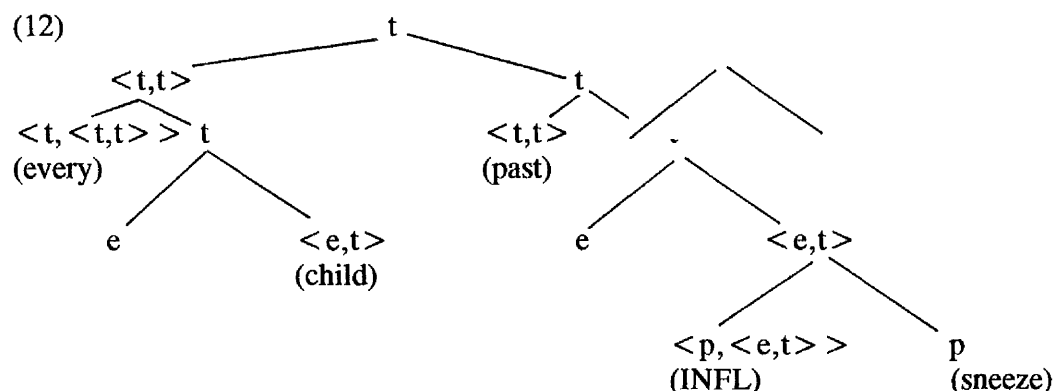
The lexical items in (10) have as part of their specification, the following properties:

- (11)
- | | |
|---------|--------------------------|
| every: | [____ N] _{DET} |
| child: | [] _N |
| sneeze: | [] _v |
| -ed: | [V ____] (affix) |

Notice that the specifications in (11) are in the vocabulary that is required for forming Surface Form representations. In addition to (11) the lexical entry of each item contains a specification of the logical type of the expression and it is these that drive the assignment of a logical form to the string:

- (11')
- | | |
|---------|-------------------------------|
| every: | < t, < t, t > > |
| child: | < e, t > |
| sneeze: | p |
| -ed: | < t, t > |
| INFL: | < p, < e, t > > ¹³ |

The Logical Form induced by the type specifications in (11') is given below:



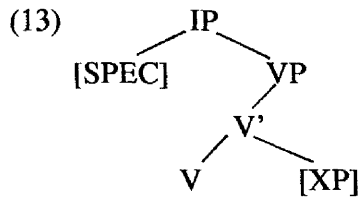
Notice how the surface configuration of *Every child sneezed* in (10) does not correspond to its logical configuration (12), particularly with respect to the structure of NP *every child*. Firstly, the subject of the clause (*every child*) is the sister of I' in (10) while in (12) it appears as an adjunction structure. *sneeze* and the *past* tense are sisters in (10) but not in (12). Finally, *every* and *child* are not sisters either. The reason for these mismatches is similar: although the c-selectional restrictions of lexical items guarantee the sisterhood relation in the surface representation, their logical type-specifications induces the creation of non-isomorphic structures to satisfy their type specifications. For example, *every* as a determiner requires the presence of a noun. But despite this c-selectional restriction, the logical type of *every* which is $\langle t, \langle t, t \rangle \rangle$ forces the building of an adjunction structure as a sister to the IP. This position can then host, at Logical Form, the operator projected by *every*, which binds an associated variable in the restrictive clause, and in the main assertion in cases where there is a pronominal there, such as in *Every child thinks she's adequate*. This analysis of *every* as a binary propositional operator $\langle t, \langle t, t \rangle \rangle$ rather than the standard semantic type $\langle \langle e, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle$ is the direct result of a commitment to providing a unified account of pronominal anaphora. On this view, a pronoun is construed as a bound variable if it is pragmatically identified by a variable present in the structure, this being a configuration with a quantifier and a variable. Otherwise it is construed as a discourse referential pronoun.

The mapping from the surface configuration of *Every child sneezed* to its logical configuration involves an enrichment process which creates the suitable structures in line with the least effort principle laid out by Relevance Theory. What this means is that an adjunction structure has to be formed using minimal effort, this being defined as the tree with the least modifications made, from the input that satisfies the total set of type specification. Looking again at the mismatches, *every child*, being a $\langle t, t \rangle$, cannot combine with *I'* which is of type $\langle e, t \rangle$, and *sneeze*, being a p cannot combine with past tense which is $\langle t, t \rangle$. Requiring a t , the past tense adjoins to the first t available. The creation of the remaining adjunction sites follow similar lines and *every child* adjoins to the node created by the past tense affix. Hence, the process of mapping one tree structure onto the other is assumed to be part of a pragmatic process mapping the lexicon internal information onto a fully specified logical representation. The motivation behind this is the need to provide a vocabulary for assigning interpretation to pronominals which manipulates the use of variables. A detailed exposition of the mapping procedures is provided in Kempson (1988a, 1990a).

Although it captures the properties of English quantified expressions, it will be shown in later sections that this procedure of mapping one structure to the other in terms of adhering to the least effort principle proves to be too unconstrained with respect to the Turkish data under investigation. We shall now look at the components of this model in more detail.

2.221 Surface Form

The requisite categorial information is specified in the lexicon, and projected onto a hierarchical structure of the kind standardly assumed in GB (following discussions in Stowell 1981).¹⁴ Kempson (1990a) argues that Surface Form in Licensing Grammar conforms to the standard X' structure as exemplified by (13):



Given that the grammar of English disallows constructions such as:

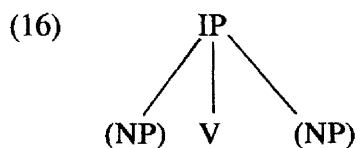
(14) *John hit.

let us assume that the c(ategorical)-selection specifications that would permit a transitive verb such as *hit* to be base generated in the verbal position in (13) are:

(15) *hit* : [____NP]_v

Intransitive verbs would be represented in a similar fashion with the difference being that the lexical specification would not contain a complement position.

An alternative approach to surface structure is, of course, the non-configurationality hypothesis suggested by Hale (1983, and previous work), and taken up in a number of works (cf. Kiss 1981, Farmer 1984, Fukui and Speas 1986, Catsimali 1990, among others). According to Hale configurationality is parameterised with respect to the levels at which hierarchy is maintained: some languages, such as English, display hierarchy at all levels, whereas others, such as West Greenlandic are configurational only at LF, hence displaying a surface structure of the kind given below, where the position of the NP arguments depends on language particular properties of directionality.



Making a choice between (13) and (16) has crucial consequences in a number of areas, the most important of which is the implications it has for the presence or absence of a VP node. The lack of such a node, as in (16) would neutralise subject/object asymmetries due to the fact that subjects and objects would mutually c-command each other. Kornfilt (1990b) argues that a language such as Turkish which displays free word order with respect to the major constituents must still be assigned a hierarchical structure. This conclusion is argued to follow from a number of facts. One of these is that Turkish has VP anaphora. Sentences containing *öyle* 'thus' are shown to replace whole VPs but not segments of VPs.¹⁵ In this respect, Turkish, a language which does not impose an order on its major constituents, behaves just like a language which respects strict hierarchy. Another piece of evidence comes from constructions with the empty elements *pro* and *PRO*. Kornfilt argues that there is evidence for the presence of both of these in Turkish, and that they are distinct in a number of ways as has been argued in general for these empty categories. The conditions on the occurrence of the empty element *PRO* require it to be in an ungoverned position. Kornfilt shows that the reasons requiring *PRO* to be in such a position hold in Turkish as well: it cannot co-occur with agreement, illustrated in (17b), in other words it has to be in a position which is not governed by the verb. Such a position can only be one which is not c-commanded by the verb; hence the position that this element occupies cannot be a sister of the verb. The relevant examples are given below:

- (17) a. Sırf Hasan [*pro* yarışma-yı kazan-acag-ın]-ı um-uyor-du.
 only race-ACC win-NOM-3-ACC hope-PROG-PAST
 Only Hasan hoped that he would win the race.
- b. Sırf Hasan [*PRO* yarışma-yı kazan-ma]-yı um-uyor-du.
 only race-ACC win-INFN-ACC hope-PROG-PAST
 Only Hasan hoped to win the race.

Such arguments certainly suggest that within a GB perspective the formulation of grammar requires the presence of a VP node at S-structure, although the definition of configurationality depends on theory internal properties of empty elements.

It does not follow, however, from either of the arguments above that configurationality has to be expressed over surface configurations. Once the underdeterminacy of encoded linguistic content is recognised, neither VP anaphora, nor the difference between *pro* and *PRO* require the presence of a hierarchical surface representation. VP anaphora, like pronominal anaphora, is a paradigm case of underspecified linguistic input being subject to structural enrichment by a pragmatic process. The details of this argument can be found in Kempson (1988a, 1990a). What the data shows is that subject object asymmetries are present at a level which represents meaning. But as is the case in all types of pragmatic enrichment, properties of the interpretation of VPs provide evidence for properties of the representation of that interpretation, and not of the input at surface structure. This follows from the recognition of the non-isomorphism between the input at Surface Form and its representation at Logical Form. It will emerge in due course that the logical specifications I attribute to verbs capture the fact that their arguments are necessarily asymmetrical in their hierarchical properties. As for the presence of the VP node, again, the logical specification of (transitive) verbs draw an asymmetry between the external and the internal argument. What is open to question is why configurationality has to be displayed at every level other than to fulfil the requirements of the Projection Principle, a (partially) theory internal constraint.¹⁶ I shall leave the discussion of the status of the Projection Principle, as well as other issues relating to configurationality to the final chapter. However, I note in passing that with two levels describing different properties of syntactic structure, a requirement that all properties be present at both levels cannot be sustained. Otherwise, the two level analysis would be stripped of its empirical content. On the contrary, I shall assume that properties which are captured by configurationality requirements of the logic need no further specification in any

corresponding representation.

Let us look at c-selectional restrictions with respect to Turkish. Unlike English, many languages, Turkish among them, allow optionality for complements of transitive verbs (in fact, even in English this is not a clear cut case).¹⁷ The questions we must therefore answer are (i) whether we want transitivity to be part of the categorial specification of a verb, and (ii) whether we want a hierarchical X' configuration like (13) for languages which do not require the overt expression of (direct) object complements. Consider the following sentences:

(18) a. Ahmet vur-du.
 shoot-PAST
 Ahmet shot.

b. Ahmet Mehmed-i vur-du.
 -ACC shoot-PAST
 Ahmet shot Mehmet.

Notice that *vur* 'shoot' in (18a) is not on a par with verbs like *eat* in English, which in the absence of a direct object have to be construed as intransitive. (18a) can be a reply to a sentence like 'Who shot Mehmet?', whereas 'John ate' is ungrammatical as a reply to 'Who ate the cake?' The answer to (i), then, seems to be straightforward in the face of (18a): transitivity does not affect the structure of Surface Form in Turkish, therefore it would be incorrect to represent it as a c-selectional specification. The c-selectional specification of transitive verbs in Turkish is []_v, whereas in English it is []_{vr}. Representing a transitive verb as []_v appears, at first sight, to be inadequate. If the ability to appear with a direct object complement is not stated anywhere, how would one rule out its appearance with intransitive verbs which are also []_v? The answer is that c-selectional specifications of lexical items are not the only set of properties capturing

configurational aspects of the constructions containing these lexical items. The fact that the model allows for non-isomorphic representations is functional exactly at this point; if a property of some kind can be represented at one level, it might be the case that it does not have to be represented at another level unless other factors require it.

At this stage I would like to elucidate the way in which I shall use the term "transitive". In the literature the term transitivity usually refers to the semantic properties of two-place predicates. But because this coincides in some languages with the obligatory presence of a direct object complement at S-structure, transitivity has been used interchangeably with the property of a verb requiring the syntactic presence of an internal argument. Here, in order to avert confusion, I shall refrain from using the term transitivity to refer to properties at Logical Form. For the purposes of logic I shall refer to verbs in terms of the number of arguments they take, that is, as n-place predicates. The obligatoriness of a direct object complement is totally irrelevant to the logical structure of verbs: in some languages like English, the presence of a direct object NPs is a factor affecting grammaticality at Surface Form, in others, like Turkish it is not. This difference is captured by the discreteness of the c-selectional properties of two-place predicates in the two languages. English two-place predicates are [___ NP]_v, whereas Turkish ones are [___]_v. Although both transitives and intransitives in Turkish are [___]_v, their logical properties set them apart to provide the appropriate logical representations. Given that transitivity is transparent in English at the surface, but not in Turkish, such specifications seem to capture those properties of transitive verbs which are relevant to Surface Form only, with the proviso that the argument structure of the verb finds an explicit representation elsewhere, that is, in Logical Form.

As it stands, whether simplex verbs such as transitives and intransitives can be generated either into a hierarchical Surface Form or onto a flat one will depend on the degree to which hierarchy relations can be captured at Logical Form. We shall see in section 2.23 that this claim can be sustained in the case of complex predicates as well.

If Logical Form is structured enough to represent hierarchy, then there should be no need to posit a hierarchical Surface Form. In what follows, I shall assume a flat Surface Form to see how much of the burden of representing configurationality can be taken on by Logical Form.

2.222 Logical Form

Like Surface Form, Logical Form is also induced by lexical properties, this time those encoding logical specifications. What is meant by a logical property in Licensing Grammar is specifically the logical "type-specification" of a lexical item defined within Montague's PTQ.¹⁸ This logic is based on the theory of simple types with *e* (individual) and *t* (truth value) as primitives. All other types are recursively defined as functions from one type to another; given that *e* is a type and *t* is a type, $\langle e, t \rangle$ is a type that is a function from individuals to truth values, in other words, a one-place predicate. Types such as $\langle e, t \rangle$ are ordered pairs where function application respects the order in which the primitives occur. (Hence $\langle e, t \rangle \neq \langle t, e \rangle$). There are no external conditions imposed on the formation of types. All such ordered pairs can be used as types in other ordered pairs, which provides the system with an infinite number of types.

Assigning lexical items a type specification is particularly suitable in Licensing Grammar since Logical Form is a Language of Thought construct and not a natural language construct. Using type-theory, therefore, provides a means for distinguishing between the two systems right from the start, in terms of the vocabulary that is involved. More importantly, type-theoretic notation exposes the combinatorial process more transparently than category labels. The type each lexical item requires for a well-formed combination is part of the type specification of that item.

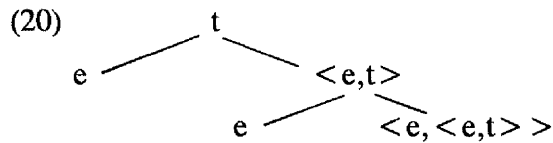
In order to understand the basis for structure in Logical Form, one needs first to look at the lexical specifications that induce Logical Form configurations. A transitive

verb like *hit* is a two-place predicate, requiring to combine with an individual to form a construct which, when combined with another individual provides a well-formed formula, a truth value of type *t*, the logical type of a proposition. The s-selectional specification of *hit* is:

(19) $\langle e, \langle e, t \rangle \rangle$

This is how a transitive verb in any language is logically specified: a two-place predicate is a relation between individual entities, equivalently a function from an individual argument to a one-place predicate, itself a function from individuals to truth values.

We can now see perhaps more clearly, why transitivity in Turkish is not a required property at Surface Form. It is the logic that captures the full expression of argument structure, with Surface Form indicating the well-formedness conditions of individual language systems.¹⁹ Type specifications do not only spell out the argument structure of a verb. In this model, given its commitment to a representational concept of meaning, type specifications are taken to show how an item combines combinatorially with other items to form well-formed logical forms. In other words, the type specification of each expression provides instructions as to how the meaning of an item is to interact combinatorially with the meaning of other items. The Logical Form (19) maps onto is given below, this being induced by the type specification of the verb given in (20):



Whether all arguments are expressed at Surface Form, as in English, or are optional as in Turkish, does not affect the Logical Form construct: this is the level where argument structure is represented and if they are not recoverable from Surface Form, they will be recoverable from the context by means of pragmatic factors.²⁰ Notice that we are not constructing Surface Forms in a similar manner: that is, we are not building grammar-internal structure by pragmatic means, but only using this device in building Logical Form.

I now turn to a question raised in the previous section, namely what stops intransitive verbs from having direct object complements (at Surface Form) if we allow category $[\]_v$ to have a direct object, as is the case with transitive verbs in Turkish. The answer is that nothing stops an intransitive verb from appearing with a direct object, other than the fact that this direct object will be uninterpreted at Logical Form. Let us illustrate. An intransitive verb such as *die* is specified in this system as :

- (21) a. $[\]_v$
 b. $\langle e,t \rangle$

where (21a) generates the Surface Form and (21b) the Logical Form. A sentence like:

- (22) *John died the man.

will not be ungrammatical by virtue of (21a) disallowing it (because it does not), but rather because this specification cannot map onto a well-formed expression of the logic without violating some principles which require the use of all information given in the

logical properties of *die*, including the specification that *die* is a one-place predicate with only one argument slot.

This gives us an indication about the interaction between Surface Form and Logical Form determining grammaticality. As Kempson (1988c) argues, the grammaticality of a sentence does not solely depend on whether restrictions internal to the (natural language) grammar preclude it, but also depends on the well-formedness of the logic which the expression has to map onto. It is possible to interpret this partly as a manifestation of the Principle of Full Interpretation presented in Chomsky (1986a). There the Principle of Full Interpretation is formulated in terms of the nonvacuous contribution of linguistic entities *at LF* to the structural analysis of a string. Kempson (1988a) suggests a different interpretation of this principle, and argues that the level which is the input to this principle is not LF (or Logical Form) but Surface Form (which she calls S-structure). She argues that every expression at S-structure contributes to the interpretation of an utterance, either by its type specification which induces a logical form for the utterance, or by other means (such as contextual delineation mechanisms, to be explained below) which induce a propositional form for the utterance.²¹ I take this second proposal to be the appropriate one. (22) can then be ruled out as ungrammatical by virtue of the fact that *the man* cannot be interpreted, given the lexical specifications of another lexical item, namely, *die* which is a one-place predicate.²²

2.223 Lexicon

Throughout the above characterisations, we have relied crucially on lexical specifications for Surface and Logical Form configurations concluding that the discrepancy between Surface Form and Logical Form was an encoded property stemming from the disparity of lexical specifications. I have suggested that each lexical item has c-selectional and s-selectional specifications which are the input to Surface Form and Logical Form respectively. These specifications are repeated below:

(23)	c-selection	s-selection
<i>die</i>	[] _{vintr}	< e, t >
<i>shoot</i>	[] _{vtr}	< e, < e, t > >
<i>öl</i> 'die'	[] _v	< e, t >
<i>vur</i> 'shoot'	[] _v	< e, < e, t > >

Specifying lexical information in this form is not new. C-selectional properties are generally accepted by syntacticians, and formal semanticists take type specifications to capture semantic properties. Moreover, s-selection properties are the main lexical properties in GB (cf. Chomsky 1986a), although different in content from what I am proposing here.²³ What is new is that such concepts provide information relevant to linguistic content concurrently.

Type specifications do not constitute the sole repository of meaning. Apart from their selectional properties and phonological specifications, lexical items can contain information in the form of meaning postulates. In cases where the type specification of two or more lexical items is nondistinct yet the lexical items in question induce different configurations, such differences will be encoded as meaning postulates. A case in point is reflexives and reciprocals which are both intransitivisers but differ in other respects (cf. sections 2.234 and 2.235.)

Finally, lexical items may also contain information that restricts, in Relevance Theory terms, the drawing of pragmatic inferences. There are suggestions in the literature (Blakemore 1987, Itani-Kaufmann 1988, Wilson and Sperber 1990) that certain connectives function as discourse directives: some, like *after all* introduce a proposition which specifically has to be used as a premise, others like *but* contain as part of their lexical information a constraint on relevance. Similarly, expletives are argued to contribute to interpretation by delineating the relation between the context and the proposition being constructed (cf. Kempson 1988a).

2.23 Application

This section is devoted to applying the tenets of Licensing Grammar to nominal compounds and causative, passive, reflexive and reciprocal suffixes. As I have said before, I shall assume a flat Surface Form, and given this, I shall specifically focus on how a Montague style type-theoretic analysis can be employed to represent configurational properties of Logical Form.

2.231 Bracketing paradoxes revisited

The mismatch presented by bracketing paradoxes receives an unforced resolution in Licensing Grammar. To repeat, the problem was the mismatch between two representations of a string in terms of the rules of combination applying at the relevant levels. The compound *otobüs bilet-ler-i* ‘bus tickets’ displays the mismatch with respect to the order of combination of the plural suffix *-ler* and the nominal compound marker *-(s)i*, in that for the purposes of surface order the plural marker attaches first, whereas for the purposes of semantic compositionality it attaches last. What follows will be a slightly modified version of the analysis presented in Göksel (1988).

It is important to note that a proper analysis of *-ler* and *-(s)i* requires an in-depth study of the distribution of these suffixes. Here I shall simply summarise some of the relevant properties. *-ler* is the marker for third person plural agreement in verbs, third person plural agreement in possessive constructions, and the marker of plurality of nouns. *-(s)i* is usually referred to as the marker for third person agreement (cf. George and Kornfilt 1981, Özsoy 1988), with distributional properties ranging from genitive constructions to infinitivals.²⁴ There is also disagreement as to how this suffix should be represented morphologically, as to whether it is *-(s)i*, or *-(s)i(n)*. I shall leave all such difficulties aside here and limit myself to investigating how a Licensing Grammar analysis could contribute to understanding the concatenative and combinatorial properties of *-(s)i* if two discrete systems were motivated. What is more interesting is that properties which yield Logical Forms are non-isomorphic to those which yield surface

configurations, the initial observation relating to bracketing paradoxes. Notice that this is in exact parallel with the c-selectional and s-selectional specifications of Chomsky (1986a), c-selectional specifications being required only in cases where there is a nontrivial mapping between the two.

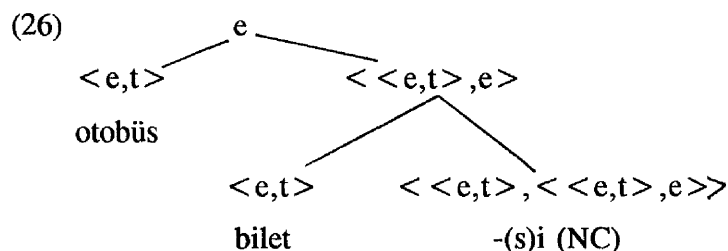
In line with claims underlying Licensing Grammar, the analysis I will motivate involves two distinct specifications for lexical items, one providing a surface representation (their c-selectional properties), the other a logical representation (their s-selectional specification). Logically *-ler* combines with an NP type to form an NP type, hence its s-selectional property is as follows:

(24) *-ler*: $\langle e, e \rangle$

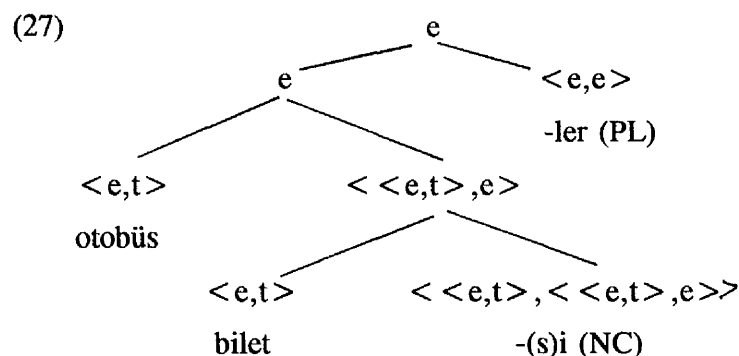
As for *-(s)i*, we have seen that the function of this suffix is to specify a relation between two elements in a nominal construction. But what is the status of these elements? Are they both noun types, N' types, or NP types? In type theory, common nouns are assigned the type $\langle e, t \rangle$ since they are unsaturated predicates (cf. Dowty, Wall and Peters 1981). To yield individuals, they combine with $\langle \langle e, t \rangle, e \rangle$ types, these being the type of determiners.²⁵ Although Turkish does not have definite and indefinite articles, it has other determiners such as demonstratives, which indicate that common nouns are of type $\langle e, t \rangle$.²⁶ The fact the nominal compound marker enables two common nouns to combine indicates that it must have the logical specification below:

(25) *-(s)i*: $\langle \langle e, t \rangle, \langle \langle e, t \rangle, e \rangle \rangle$

a type that combines with a noun (an $\langle e, t \rangle$) to yield a type that can combine with another noun (an $\langle e, t \rangle$) to give an *e*. Respecting these specifications gives us the Logical Form of the nominal compound:



It will immediately be clear that the only stage at which the plural suffix can combine is after the (logical) attachment of *-(s)i*, as illustrated below,



and not, as its surface form indicates, before *-(s)i*, which, given the logical specifications, is impossible. The plural suffix requires the logical type *e* which is provided by the combination of the nominal compound marker.

We have so far said nothing about the c-selectional properties of these suffixes. Stating the syntactic combination properties of the plural marker is straightforward. We merely have to specify that (for the data at hand) it combines with an NP and forms an NP:

(28) *-ler*: [NP ____]_{NP}

As for *-(s)i* the examples above indicate that it combines with N' rather than NP, as it

cannot occur in [N' NP] combinations:

- (29) a. eski otobüs bilet-i
 old bus ticket-NC
 old [bus ticket]

b. *otobüs eski bilet-i

In addition, one does not want to imply that it has to combine with a sequence of two N's, as the necessity of two N's is already indicated in its s-selectional specifications. It therefore has the following c-selectional specification:

- (30) -(s)i: [N' ____]_{NP}

(30) induces the following representation, (31a) being the singular, and (31b) the plural.

- (31) a.
 NP
 / \
 N' NP
 | |
 otobüs bilet-i
- b.
 NP
 / \
 N' NP
 | |
 otobüs biletleri

The question that remains is why the sequence of the surface form does not respect its logical properties, and how this is to be reflected in the lexical specification of *-(s)i*. I suggest that the c-selectional properties of *-(s)i* should include a requirement that it has to occur last in a sequence, except when it occurs with case markers in which case it has to precede the case marker. The fact that case markers must follow the nominal compound marker is an indication that the linear order of these does not follow from any logical requirement. (Just as the order of inflectional morphemes does not follow

from a logical necessity). Another property of *-(s)i* is its inability to occur with itself as in (32b), given that the genitive construction also uses this suffix as illustrated in (32a):

- (32) a. Ahmed-in bilet-i
 -GEN ticket-NC
 Ahmed's ticket.
- b. Ahmed-in otobüs bilet-i-*si
 -GEN bus ticket-NC-*NC
 Ahmed's bus ticket.

One might be tempted to attribute the ungrammaticality of the double occurrence of *-(s)i* to phonological factors. But we can immediately rule this out on the grounds that not only does *-(s)i* fail to cooccur with the presumably homophonous third person genitive marker, but it is also unable to cooccur with any other possessive marker such as *-(i)m* and *-(i)n*, the first and second person markers. Moreover, as Hankamer (1987) points out, the nonoccurrence of two *-(si)* affixes is not necessarily limited to a word internal domain and certain nominal constructions such as [_{NP} N N-*si* N-*si*] are also barred.²⁷ It is for similar reasons that Kornfilt (1984a) attributes the nonoccurrence of *-(s)i* and *-i* to a principle she calls the stuttering prohibition: a principle which states that semantically similar morphemes cannot cooccur. However, it is difficult to sustain an argument based on semantic similarity given the various functions of *-(s)i*. Apart from the difficulty of assigning it a unitary logical configuration in type-theoretic notation, there is also the problem of even finding a similarity between this and possessive affixes. The various functions of *-(s)i*, namely as a nominal compound marker, as the third person possessive marker and as a complementiser make it very difficult to assign it a unitary semantic characterisation. If, on the other hand we were to assign it a c-selectional restriction requiring that it occurred last in a sequence of elements that have

logical types, we would bar its double occurrence, as well as accounting for the sequences where it occurs before a case marker, this latter lacking a logical type.²⁸

2.232 Causative

The causative suffix in Turkish can attach to verbal bases as in (33a) and to a few adjectives to produce verbs as in (33b).²⁹

- (33) a. *çal-dır*
 steal-CAUS
 have something stolen
- b. *mor-ar*
 purple-CAUS
 to become purple

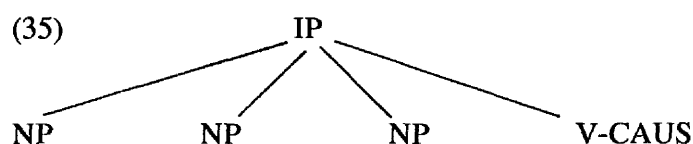
Identifying the categorial properties of the causative is straightforward in the face of the glosses in (33): it combines with a verb which is transitive or intransitive³⁰, and to a degree, irrespective of previous concatenations. Why it cannot attach to verbal stems which contain a passive or reflexive will be dealt with in Chapter VI. We can now specify the c-selectional properties of the causative as combining with a verb to yield a verb:

- (34) *-dır* : [V___]_v

The reasons for not specifying the resulting category as a transitive verb are the same as those mentioned above in section 2.221; that this is a process which applies across discrete types. In any case this term would fall short of being descriptive: since the root verb can be transitive, naming the output as transitive would not add new information.³¹

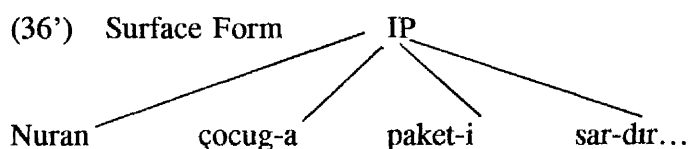
At the end of section 2.222 it was mentioned that the representation of the argument structure of complex verbs might force a choice between a configurational and a flat Surface Form, a choice which did not matter in the case of underived verbs. I shall first allow a flat Surface Form for complex predicates, subject to modification if necessary, a position which will be revised only if configurationality at Logical Form turns out to fall short of representing the full array of the properties of such constructions. It will become clear that the representation of argument structure does not require a hierarchical Surface Form given that we can make this requirement explicit at the level of Logical Form.

I shall assume that the c-selectional property of the causative yields the following representation:



So a sentence like (36) will be represented as in (36'):

- (36) Nuran *çocuk-a paket-i sar-dır-dı*.
 child-DAT pack-ACC wrap-CAUS-PAST.
 Nuran made the child wrap the pack.



Recall that the order of constituents does not affect the grammaticality of the sentence, as Turkish allows the scrambling of arguments.

Sentences where causatives combine with intransitives, such as (37) below, are assigned a structure identical to (36'), despite the difference in interpretation of the dative case marked NP. Consider a sentence like:

- (37) Nuran bardag-ı yer-e düş-ür-dü.
 glass-ACC ground-DAT fall-CAUS-PAST
 Nuran made the glass fall on the ground. (dropped the glass)

In (36) the dative NP is the causee, whereas in (37) it is an adverbial. It will be shown in Chapter III that the logical representation, together with properties of case marking draws the required distinction, obviating the need to represent it at Surface Form.

The specification of the logical properties of the causative suffix depends on its status as a (logical) transitivity. If it is a transitivity its function will be merely to increase the argument structure of a verb by one. The other alternative is that it is a type which requires a sentential argument. I shall provide a discussion of the process of transitivity versus causativity first in section 4.2312 where I shall show that from a morpho-phonological point of view there is no difference between a causativiser and a transitivity, and then in section 4.3 where I will provide further logical support for this claim. At this stage of the exposition of Licensing Grammar I will simply assume that the causative suffix combines logically with a proposition to yield a one-place predicate:

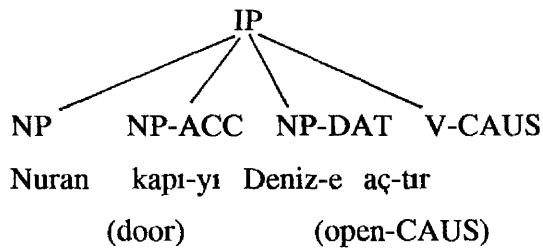
- (38) *-dir* : $\langle t, \langle e, t \rangle \rangle$

This representation enables us to state that the causative suffix s-selects a sentential complement, while retaining the intuition that there is an additional argument (the *e* of the $\langle e, t \rangle$) imposed on an already present argument structure.

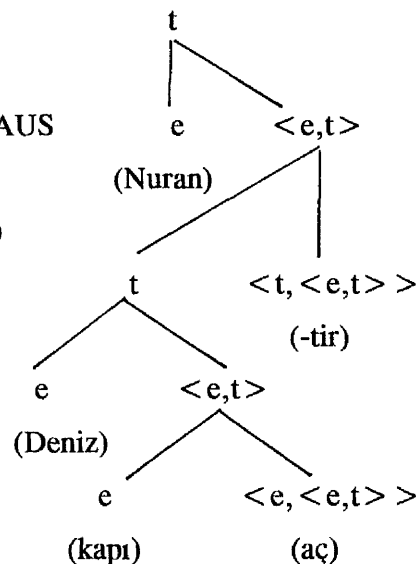
Starting with the simplest cases, the causative in (38) provides the representations in (39') for the string in (39).

- (39) Nuran Deniz-e kapı-yı aç-tır-dı.
 -DAT door-ACC open-CAUS-PAST
 Nuran made Deniz open the door.

(39') a. Surface Form



b. Logical Form



Given that the mapping from Surface Form to Logical Form is a translational process which has to comply with certain restrictions, there are two separate means of accomplishing this. One is an independent projection onto a logical structure directly from the lexicon. This is a bottom-up procedure where the starting point is the major premise, the root verb. On this account, the two place predicate *aç* 'open' would combine with the element which its type specification allowed, which in this case is the accusative case marked NP *kapı* 'door'.³² The combination of these two would give a one-place predicate. This itself would then combine with the logical type of *Deniz* which is an individual, to yield the logical type t , the type that a causative can combine

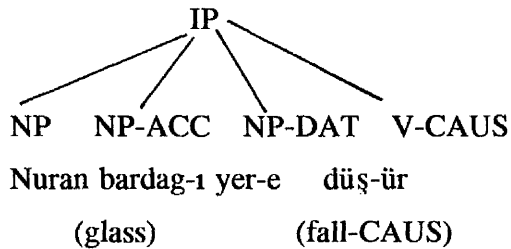
with. It is at this stage that the causative could find a suitable position to adjoin to. In this sense the requirement of forming an adjunction structure at the most minimal point, as argued above, would be fulfilled. The combination of the causative and the functional complex *t* would take place to yield a one place predicate, an $\langle e, t \rangle$ which upon combining with *Nuran* would provide a *t*. Note that this mode of combination in the logic follows a bottom-up pattern, with the leftmost morpheme (the root verb) taken as a starting point to build a logical configuration.

Suppose, on the other hand, that we assume the projection onto a logical level to be a progressive modification of the Surface Form tree, as is the S-structure/LF mapping via Quantifier Raising in GB. Then instead of taking the root verb as the first element to have its logical properties fulfilled, we would start from the causative morpheme, this being the outermost one (excluding tense and other inflectional elements). Since what the causative requires is a node which has the logical type *t*, the fulfilment of its properties would have to be withheld until a suitable type were found. Such a type would take two steps as we have seen above: the combination of the root verb with its arguments. In this particular construction there is only one affix, and the outcome of both routes is similar. After all, there seems to be no immediate problem with holding an affix until a suitable position is created. For the purposes of the exposition at this stage, I shall take the bottom-up pattern of starting from the root verb as the less problematic of the two. However, as we shall see in due course both routes present problems when there is more than one affix.

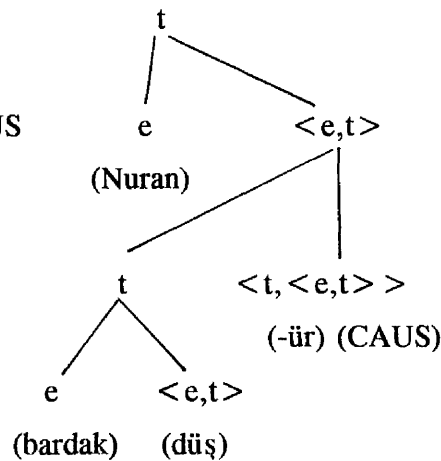
The logical representation for a causative combining with an intransitive verb follows a similar pattern, except for the representation of the adverbial phrase *yere* 'on the floor':

- (40) *Nuran bardag-ı yer-e düş-ür-dü.*
 glass-ACC floor-DAT fall-CAUS-PAST
 Nuran made the glass fall on the floor. (dropped the glass)

(40') a. Surface Form



b. Logical Form



The adverbial can be an adjunct on the lower t , or on the higher t , a decision which will left aside until later when we look at the properties of adverbials in somewhat more detail.

Although the sentences in (39) and (40) are identical at Surface Form, they nevertheless map onto dissimilar logical representations. One might ask why a dative marked NP (*Deniz-e*) appears as an argument in (39'b) whereas a seemingly similar item (*yer-e*) is the adverbial in (39'b). The reason why such an element cannot be an argument in (40'b) is because the root verb has only one argument slot, to be filled by the accusative marked NP, and there is simply no place for another argument. On the other hand, the reason why the dative marked NP in (39'b) is an argument but not an adverbial has to do with the semantics of that lexical item alone. That is, if *Deniz-e* were replaced by another dative marked NP, say *balkon-a* 'to the balcony', this would force a reading where this NP would be interpreted as an adverbial. Causatives of transitives are systematically ambiguous, and the intended interpretation is recoverable by standard disambiguation processes in accordance with the tenets of relevance theory. In cases where the argument slot corresponding to the position of the causee is left unfilled, the referent would be recovered from the context.

2.233 Passive

Turkish is a language in which a passive construction is available for all verbs except a few that are lexically specified. The passive morpheme attaches to transitive verbs as (41) and intransitives as in (42):

- (41) a. Bu dükkân-da kitap sat-ıl-ma-z.
 this shop-LOC book sell-PASS-NEG-AOR
 Book(s) are not sold at this shop.

- b. Bura-dan dağlar gör-ül-ür.
 here-ABL mountains see-PASS-AOR
 The mountains are seen from here.

- (42) a. Bu oda-da dur-ul-ma-z.
 this room-LOC stay-PASS-NEG-AOR
 (One) cannot stay in this room.

- b. Ankara-ya bu yol-dan gid-il-ir.
 -LOC this road-ABL go-PASS-AOR
 (One) can go to Ankara by this road.³³

This is a phenomenon which resists a uniform explanation in standard accounts of the passive, focusing as they do on the case of transitives. Let us assume here that the c--selection specification of the passive is the following:³⁴

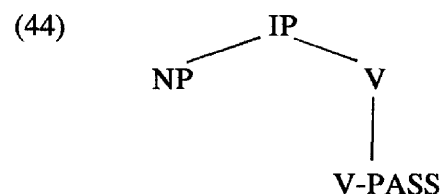
- (43) -il: [V___]_v

Since the transitivity of the root verb is irrelevant, there is no need to specify it for this feature. But this time there is additional reason for not wanting to call it intransitive

because unlike underived intransitives, the passive complex predicate (when formed from an intransitive verb) lacks an expressible agent. Generalising it as an intransitive verb would be inconsistent with properties of intransitive verbs.

The instructions of the passive suffix *-il* regarding the construction of surface syntactic configurations are thus identical to the c-selectional specification of the causative. As in the causative, all that is needed for the purposes of surface syntax is the information that *-il* attaches to verbs.

Again, assuming that the surface configuration of passive sentences is flat the specification in (43) creates a Surface Form such as the one given below:



where the passive complex predicate appears as a single unit.

Turning to its logical properties, it is uncontentious that, whatever the process, the result of passivisation creates a predicate which has one argument slot fewer than the root verb. This property has been the guideline both in syntactic analyses such as GB, and in Montague Semantics. In GB, following Jaeggli (1986), the passive morpheme is standardly analysed as the theta-role absorber of an argument, an account which is elaborated in Roberts (1987), Baker (1988) and Baker, Johnson and Roberts (1989). The semantic analogue of this view is the assignment of a reduction constant (R_s) (cf. Dowty, Wall and Peters 1981) to the passive morpheme which is of the following type:

(45) $\langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$

This is a function from two-place predicates to one-place predicates, a characterisation which is only valid, of course, in the passivisation of transitive verbs. Languages like Turkish, where intransitive verbs are also passivised, would then require another characterisation, given below:

(46) $\langle \langle e, t \rangle, t \rangle$

A dual characterisation of this particular kind, i.e. simultaneously having (45) and (46) would fail to unify the "argument-absorption" property of the passive, in any case, and would therefore be inadequate.

It might seem that characterising the property of the passive suffix is necessarily non-unitary in its type specification. A closer look at the properties of the passive, however, indicates that a unitary specification is possible on Licensing Grammar assumptions. Consider first the passivisation of intransitive verbs:

- (47) a. *Soguk-ta don-arak öl-ün-ür.*
 cold-LOC freeze-ADV die-PASS-AOR
 In the cold, (one) dies by freezing.
- b. *Yaz-ın Londra'da dur-ul-ma-z.*
 summer-LOC London-LOC stay-PASS-NEG-AOR
 In summer, (one) can't stay in London.
- c. *Bu yol-dan sahil-e gid-il-ir.*
 this road-ABL coast-DAT go-PASS-AOR
 By this road (one) can go to the coast.

As mentioned above, passives of intransitives lack subjects. Lacking a subject is an expected property of "pro-drop" languages, a property which is said to correlate with the presence of agreement. However, the sentences in (47) also lack an agreement morpheme on the verb. Moreover, sentences with intransitive passives disallow the expression of the logical subject even as an agent phrase, as illustrated below:

(48) a. *Soguk-ta insanlar tarafından don-arak öl-ün-ür.
people by

b. *Yaz-ın insanlar tarafından Londra'da dur-ul-ma-z.
people by

c. *Bu yol-dan insanlar tarafından sahil-e gid-il-ir.
people by

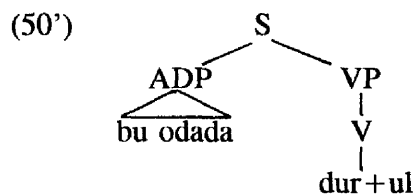
Since the sentences in (47) lack (logical) subjects even to the extent that these are not allowed to appear as agent phrases, I will claim that logically, the passive morpheme combines directly with predicates to form propositions without any further provision of an argument. We can thus take (46), repeated below, to be the sole specification of the passive.

(49) *-il*: $\langle \langle e, t \rangle, t \rangle$

This was stated above as the logical specification that combines the passive with the logical type of an intransitive only. Before looking at how a passive can combine with a transitive verb given this property, let us first take the more straightforward case of intransitives.

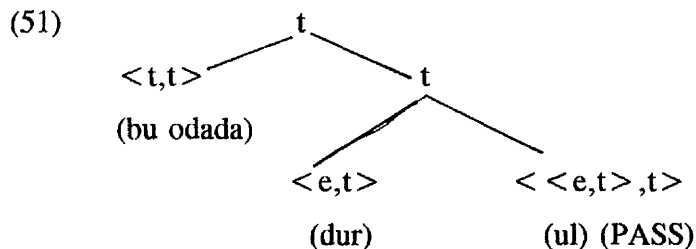
A sentence like (42a) repeated here as (50), will have the surface representation in (50'):

- (50) Bu oda-da dur-ul-ma-z.
 this room-LOC stay-PASS-NEG-AOR
 (One) cannot stay in this room.



The categorial properties in (43) which indicate that the passive combines with a verb are thus fulfilled.

The fulfilment of its logical properties require the passive to combine with an $\langle e, t \rangle$, as specified in (49). Such an $\langle e, t \rangle$ is provided by the VP node, this being the syntactic correlate of $\langle e, t \rangle$. The passive morpheme creates an adjunction site which serves to fulfil this property. The resulting configuration is given below:

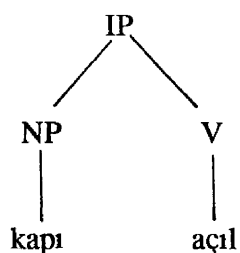


Turning now to the combination of the passive morpheme with a transitive verb, this takes place in a similar fashion, the only difference being the presence of a surface subject:

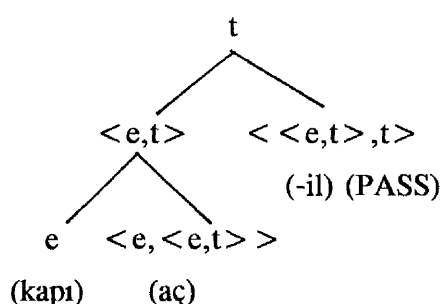
- (52) Kapı aç-ıl-dı.
 door open-PASS-PAST
 The door opened.

The surface representation of (52) is straightforward. As in (36'), the passive combines with a verb and is generated as a single unit at surface structure. As for the logical configuration, this involves the building up of a well-formed construct where the logical properties of the lexical items are satisfied. The discussion about the route of combination in (39'b) directly applies here as well. If we start from the root verb there is no apparent problem. Being a two-place predicate it combines with the argument first, and the output of this, an $\langle e, t \rangle$ is the type that the passive requires. But suppose we start from the outermost element *-il*. We know from its lexical specifications that it has to combine with the logical type of an intransitive verb. At first sight, there does not seem to be a suitable logical type that fulfils the logical requirements of the passive, since *aç* 'open' is a transitive verb, an element of type $\langle e, \langle e, t \rangle \rangle$. However a proper structure is built when the logical properties of this transitive verb are satisfied. Like all transitive verbs, it is subcategorised for an internal argument, requiring an element of type e , an individual, to form an $\langle e, t \rangle$. The logical type of the transitive root verb combines with the logical type of a NP, thus yielding the logical type of an intransitive verb. In other words, the surface subject which is the logical object of the verb occurs in a configuration in which its combination with the verb creates a saturated VP, logically an $\langle e, t \rangle$. More specifically, $\langle aç \rangle$ 'open' (where $\langle \rangle$ refer to logical types), first combines with $\langle kapı \rangle$ 'door' yielding $\langle kapı aç \rangle$. It is this $\langle e, t \rangle$ provides the suitable type for the passive to combine with. Thus, an appropriate structure is created: the passive adjoins to a position which is the sister of the logical type of a VP, as illustrated below. Furthermore such an $\langle e, t \rangle$ is a type that the passive *must* combine with, since it has to form an adjunction structure at the earliest possible opportunity.

(53) a. Surface Form



b. Logical Form



Again the properties of the root verb have to be satisfied first. Hence a bottom-up procedure seems to be the only option available.

A question that immediately comes to mind concerns the non-symmetry between the logical forms in (51)/(53b) and their corresponding Surface Form representations where it is obvious that the latter are both equally flat. The flatness of the Surface Form is deceptive until one considers the properties of the root verbs: 'open' is a transitive verb requiring two arguments, whereas 'fall' is intransitive and requires only one argument. Since argument structure is fully represented at Logical Form, the similarity between their Surface Form becomes trivial. Once we adopt the position that logical forms are projected direct from the lexicon and not via progressive transformation of the Surface Form, we expect this kind of mismatch between levels. Turkish being a language where no arguments need to be represented at Surface Form fits in with such a mismatch. As long as argument structure is represented at Logical Form, the non-representation of arguments at Surface Form is not a problem.

(53), like (51), also displays a mismatch between surface configurations and logical configurations, but this time the non-isomorphism not only involves the branching pattern, but also a category/type mismatch relating to the combinatorial properties of a lexical item, namely *-il*. That is, whereas *-il* is attached to a V at Surface Form, it is attached to the logical type of VP, and not of V, at Logical Form. This may

seem like a mismatch which calls for an explanation, and such a clash indeed turns into a problem in theories which are based on an isomorphism between surface structures and logical structures. However, in Licensing Grammar, the two levels of representation belong to two separate systems, and therefore as long as the mapping from one to another involves some structural change, the mismatch is directly licensed.

The present proposal, although capturing the basic intuition relating to passives, namely the property of argument reduction, differs both from standard GB analyses and from type-theoretic accounts of the passive. GB analyses crucially rely on a multi-stratal syntax due to their rendition of the passive complex predicate as being unable to assign case.³⁵ It will be shown in the following chapters that the case pattern in passive constructions can be explained quite naturally by the interaction of the structure forming properties of the case markers and the logical properties of the passive. It will emerge that the lexical specification attributed to the accusative case marker in Turkish is incompatible with the lexical specification of the passive, hence constructions having both the passive and an accusative case marked NP are predicted to be ungrammatical.

The difference between the present proposal and a purely type-theoretic account is that here we are assigning a different type to the passive than what has been regarded as the canonical representation of the passive morpheme, an intransitiviser of type $\langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$. This is, of course, due to the fact that Montague Semantics was intended as a semantic characterisation of a fragment of English and was therefore only sufficient in providing for the passivisation of transitives. As it stands, our characterisation of the passive can be accommodated in type-theory without any difficulty.

An alternative analysis of the passive based on a different version of type-theory is provided by Chierchia (1988). In Chierchia's version of Intensional Logic (abbreviated as IL) there are two basic types *e* (individuals) and *p* (propositions), as I

mentioned earlier. However, one of the aspects that distinguishes IL from Montague's IL is that it is more restricted in terms of the layers of types.³⁶ For a full analysis of this model the reader is referred to Chierchia (1985) and Chierchia and Turner (1988). What interests us is the role played by properties in the characterisation of passivisation. Properties are types that can be saturated by a subject and they are denoted type-theoretically as one-place propositional functions, hence $\langle e, p \rangle$. (That is, properties (π) are of type $\langle e, p \rangle$, but all $\langle e, p \rangle$'s are not π ; for example Infl'.) In Chierchia's framework, VPs (such as *love John* and *run*) are properties. The passive is a function that maps functions from individuals to properties, onto properties, as illustrated below:

$$(54) \quad \text{passive: } \langle e, \pi \rangle \rightarrow \pi$$

What is disadvantageous for our purposes is that this representation involves an individual as part of the input, hence, it again characterises the passive as combining with a transitive verb.³⁷ Moreover, the output category is a property, which according to the same analysis, combines with inflection, this being the type that maps properties onto propositional functions ($\langle \pi, \langle e, p \rangle \rangle$). The concatenation of the passive morpheme with inflection would therefore yield a type that requires an e . This, however, is not a possibility for Turkish where passives of intransitives critically lack subjects.

Suppose we tried to modify (54) so that it could apply to intransitive verbs as well. We would then have the following type for the passive:

$$(55) \quad \langle \pi, p \rangle$$

(55) would of course mean that tense (Infl) would have to come into play after $\langle p \rangle$ is combinatorially formed, and would no longer have the combinatorial role ascribed to INFL by Chierchia, which is a type that takes π to form an $\langle e, t \rangle$. This would have

repercussions in other areas, such as in the constructions with gerundives and infinitivals (cf. Chierchia 1984), which are also properties. It seems then, that Chierchia's characterisation of the passive does not capture the properties of the passive in Turkish. Hence, I shall retain the initial position and employ the more standard type-theoretic notation for representing the passive.

The instructions of the passive suffix *-il* regarding the construction of surface syntactic configurations are identical to the *c*-selectional property of the causative. All that is needed for surface syntax is the information that *-il* attaches to verbs.

2.234 Reflexive

The reflexive suffix *-(i)n* combines only with those transitive verbs which express an action that one can inflict on oneself:

- (56) Hergün yıka-**n**-ır-lar/döv-**ün**-ür-ler/giy-**in**-ir-ler.
 every day wash-REF-AOR-3pl/beat-REF-AOR-3pl/dress-REF-AOR-3pl
 They wash/beat/dress (themselves) every day.

Morphological reflexivisation is not a productive process in Turkish and it does not even combine with all verbs which would normally be expected to reflexivise³⁸, so the verbs that can combine with *-(i)n* have to be specified for this suffix in the lexicon.³⁹ In line with what has been outlined above the lexical item *-(i)n* has the following *c*-selection specification:

- (57) *-(i)n*: [V ____]_v

The *s*-selectional specification is also straightforward. As the combination of *-(i)n* with a two-place predicate provides a one-place predicate, all we need to state in the type specification is that it is (logically) an intransitiviser as illustrated below:

(58) $-(i)n: \langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$

Although (57) and (58) jointly derive the configurational and concatenative properties of the reflexive, another property of the reflexive is left unmentioned. This property is the one that necessarily links the internal and external arguments of the root verb, thus rendering them coreferential. As there is more than one way of intransitivising a verb by identifying its two arguments, reciprocity being one, not only is a direct lexical translation $\lambda V \lambda u [V(u)(u)]^{40}$ required, but a meaning postulate which distinguishes between reflexive and reciprocal interpretations is necessary. Therefore the following meaning postulate formulating the coreferentiality of logical object and the logical subject has to be added to the specification of the reflexive affix to ensure the correct interpretation:

(59)
$$\frac{P(X)(X)}{\forall x P(x)(x)}$$

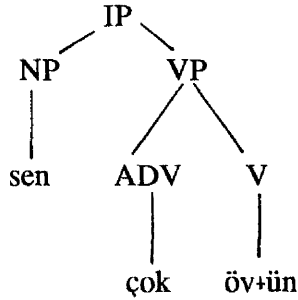
 $x \in X$

Here X is a set variable and x is a variable ranging over individual members of such a set. This meaning postulate which is, in effect, an inference rule states that given a predicate with two arguments the reflexive identifies all members of the set as coreferential. The assumption here of set variables in addition to individual variables is a consequence of a commitment to a representational view of interpretation in general.

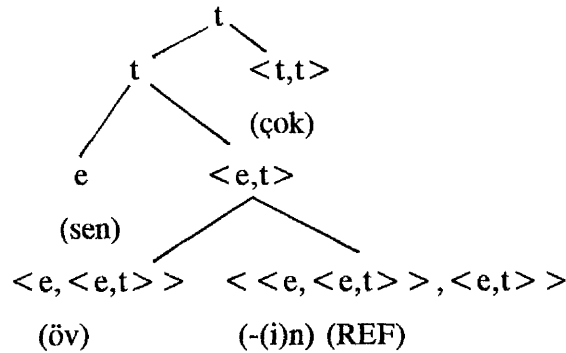
Notice that as in the case with the passive, (57) allows $-(i)n$ to combine with an intransitive verb as well as a transitive one. In cases where $-(i)n$ combines with an intransitive verb, a surface syntactic configuration will be formed, but it will be ruled out by (58), which only gives a well-formed construct if $-(i)n$ attaches to a transitive verb. A reflexive sentence such as (60), then, is represented in (60'):

(60) Sen çok öv-ün-dü-n.
 you much praise-REF-PAST-2
 You boasted a lot.

(60') a. Surface Form



b. Logical Form



The derivation in (60'b) reveals that the combination of the elements here is not similar to the way in which the causative or the passive combines. In either of the former two, the root verb combines first with its argument(s) and then with the causative or passive. Here, by contrast, the reflexive combines first followed by the combination of the argument. Otherwise, the verb *öv* 'praise' would have to combine with the e provided by *sen* 'you', in which case the reflexive would not be able to combine, since the output of the combination would be $\langle e, t \rangle$. Given the requirement that all expressions be used relative to their assigned type specification, there is only one possible order of combination in reflexives, and this is the one where the combination starts from the *outermost* morpheme. To guarantee a well-formed logical configuration, the outermost morpheme $-(i)n$ has to combine with a transitive verb. The surface configuration contains such a verb: *öv* 'praise'. $-(i)n$ combines with *öv* and forms the logical type of an intransitive verb *övün* 'boast' which is $\langle e, t \rangle$. The logical specifications of intransitive verbs require that they combine with individuals (of logical type e) to give propositions (of logical type t). Thus, t is formed, which then combines with an adverb to form another proposition. Hence, there is a discrepancy between how the causative and the passive combine on the one hand, and how the reflexive combines, on the other. It will be shown below that the combination of the reciprocal is parallel to that of the reflexive.

To summarise, *-(i)n* combines with only a small number of verbs which have to be specified to combine with it, and has the following properties apart from its phonological properties:

(61) a. *-(i)n*: [V___]_v

b. $\langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$

$\lambda V \lambda u [V(u)(u)]$

c. $\frac{P(X)(X)}{\forall x P(x)(x)}$
 $x \in X$

where the first line indicates categorial properties, the second line indicates combinatorial properties at Logical Form, and the third line indicates that for any such identified object and subject all members of the indicated set must stand in the relation of reflexivity to themselves.

2.235 Reciprocal

The reciprocal will not be taken up as a separate topic in this work. It has complex properties which interact with plurality (see, for example, Heim, Lasnik and May 1991), and here I will refer to it only in as far as it interacts with other derivational morphemes. I will therefore state its properties solely with respect to argument structure.

Reciprocals are also intransitivisers, and like reflexives they involve the identification of their arguments. They therefore share with reflexives the same s-selectional specification $\langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$ with the lexical translation $\lambda V \lambda u [V(u)(u)]$, but differ in terms of how the arguments are identified. The following meaning postulate is therefore required to distinguish it from the reflexive:

$$(62) \quad \frac{P(X)(X)}{\forall x \exists y P(x)(y)} \\ x \in X \quad y \in X$$

Stating the semantic content of reciprocals in such a simplistic way may turn out to be inadequate.⁴¹ In particular, the notion of plurality which interacts with reciprocity is a topic in its own right. The reason for choosing this representation, however, serves the purpose of displaying the respect in which it differs from the other derivational morphemes.

2.236 Sequences of derivational morphemes

I shall now look at constructions which contain multiple derivational morphemes. The interaction of the verb and the derivational morphemes in these constructions can be described as linear: in a sequence of x - y - z where the variables denote a verb and its (derivational) suffixes, the lexical specifications of each element must take as input the adjacent element. In sequences of derivational morphemes z takes as input the output of the combination of x and y , and cannot, say, skip over y and apply to x . This is a property of these suffixes in Turkish and does not follow from any principle,⁴² borne out by the existence of bracketing paradoxes. Recall that the resolution of bracketing paradoxes depended partly on stating the linear position of the nominal compound marker in a sequence of morphemes. With these grammatical function changing suffixes, there is a similar requirement of having to state the order of combination. Each such derivational morpheme must apply sequentially; in our terms, the fulfilment of the logical properties of these suffixes follows a left-to-right route.

Closer scrutiny of the combinatorial involvement of the morphemes reveals a discrepancy between the root verb on the one hand, and the grammatical function changing suffixes on the other hand. In particular, the generalisation regarding the unfolding of logical properties from left to right does not include the root verb. As mentioned above, although the type specification of the causative and the passive require

the fulfilment of the logical properties of the root verb first, the reflexive and the reciprocal have to combine directly with the verb, before the root verb has undergone the process of combining with its argument. This might not seem to be a problem at first, but as we shall shortly see allowing a random categorisation of derivational morphemes obscures certain configurational similarities and differences that are displayed in constructions containing them. Sequences of derivational morphemes highlight such discrepancies even further. Before looking at these, a reminder of the lexical specifications of the relevant morphemes is given below:

(63)	c-selection	s-selection	Meaning Postulates
causative	$[V_]\text{v}$	$\langle t, \langle e, t \rangle \rangle$	
passive	$[V_]\text{v}$	$\langle \langle e, t \rangle, t \rangle$	
reflexive	$[V_]\text{v}$	$\langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$	$\frac{P(X)(X)}{\forall x P(x)(x)}$
reciprocal	$[V_]\text{v}$	$\lambda V \lambda u [V(u)(u)]$	$\frac{x \in X}{P(X)(X)}$
		$\langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$	$\frac{\forall x \exists y P(x)(y)}{x \in X \ y \in X}$
		$\lambda V \lambda u [V(u)(u)]$	

2.2361 Causative/Passive

Passivisation and causativisation interact productively in many languages (cf. Baker 1988). As mentioned in Chapter I the passive and the causative morphemes can combine in two ways illustrated in (64) with the sequence in (65a) being grammatical in Turkish, and (65b) ungrammatical:

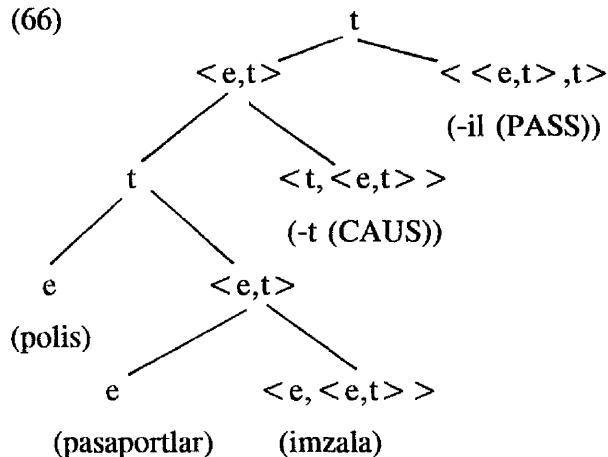
- (64) a. V-CAUS-PASS
b. V-PASS-CAUS

- (65) a. Pasaportlar polis-e imzala-t-ıl-dı.
passports police-DAT sign-CAUS-PASS-PAST
The passports were made to be signed by the police.

b. *Sema bu ev-i yap-ıl-dır-dı.
 this house-ACC build-PASS-CAUS-PAST.

Intended reading: Sema caused this house (to) be built.

At first glance, the difference in grammaticality between (65a) and (65b) is surprising. The logical properties of the passive and the causative show that these suffixes can be the input to one another, because the output of each one is exactly the type needed by the other as input. This explains why (65a) is well-formed at Surface Form. Its Logical Form too, appears at first sight to be well-formed:



The type specifications driven from the lexicon provide the mapping onto a well-formed logical construct. First the causative suffix, being the leftmost suffix combines first. The type it requires is given by the combination of the root verb with its arguments as argued in section 2.232. The output of this combination, which is the type $\langle e,t \rangle$ then becomes the input to the passive. But the mapping from Surface Form to Logical Form is not straightforward. I argued in section 2.22 that any enrichment of structure would require the creation of adjunction structures. Keeping to the proposal that a bottom-up procedure is to be followed, we first take the root verb which combinatorially gives the type t . It is true that at this point the causative has to combine and that there is a

suitable type to ensure a combination. However, the causative morpheme is not independent at this stage, because it is followed (in the linear string) by a passive morpheme. So the sequence *CAUS-PASS* has to find a node to host it. Consider a case like:

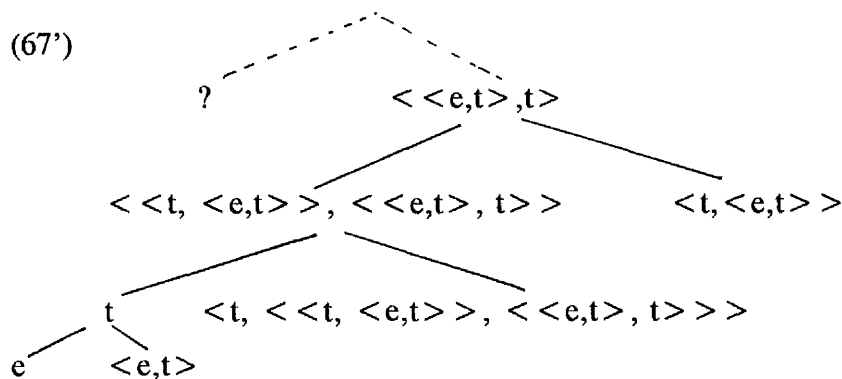
(67) John düş-ür-ül-dü.

fall-CAUS-PASS-PAST

John was made to fall.

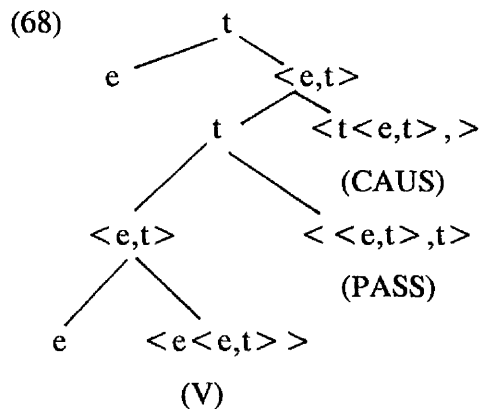
The combination of the root verb with the argument provides the logical type *t*. The leftover (disregarding tense) *ür-ül* is neither a semantic unit nor a syntactic unit, but nevertheless it has to be hosted by some node. Suppose we tried to create such a node by giving it the type specification $\langle t, \langle \langle t, \langle e, t \rangle \rangle, \langle \langle e, t \rangle, t \rangle \rangle \rangle$ a type which combines with a proposition to give the composite type of *CAUS-PASS*. The obvious question would then be the source of this node. Where does it come from? It is neither a lexically induced type nor the output of a combination. Its existence can only be attributed to a necessary step in the derivation. Then it makes the whole process the mapping from one configuration onto another by movement of a complex element which is itself not a constituent. In other words, there would be an intermediate step where the adjunct containing the causative would necessarily contain the passive. And finally, the combinatorial process could not go through for lack of suitable types:

(67')



The only way out would be to separate the passive from the causative first. This position, however, is exactly the reverse of a bottom-up procedure: if we separate the outermost suffix in a sequence of morphemes we will be allowing a top-down combination. This is the problem I have been referring to so far. For certain purposes a bottom-up pattern is the only principled combination, but at many points we are unable to maintain this kind of a derivation.

(68), which is the Logical Form of (65b) presents a somewhat different problem. Here the type specifications provide a well-formed representation, although such constructions are ungrammatical in Turkish. The other option is to rule it out on the grounds that it violates constraints on the mapping procedure, but then we have just seen that this was not a well defined strategy as it is. So here we have a pure case of logical type specifications incorrectly allowing sentences like (65b), although these are reported to be well-formed in some languages:

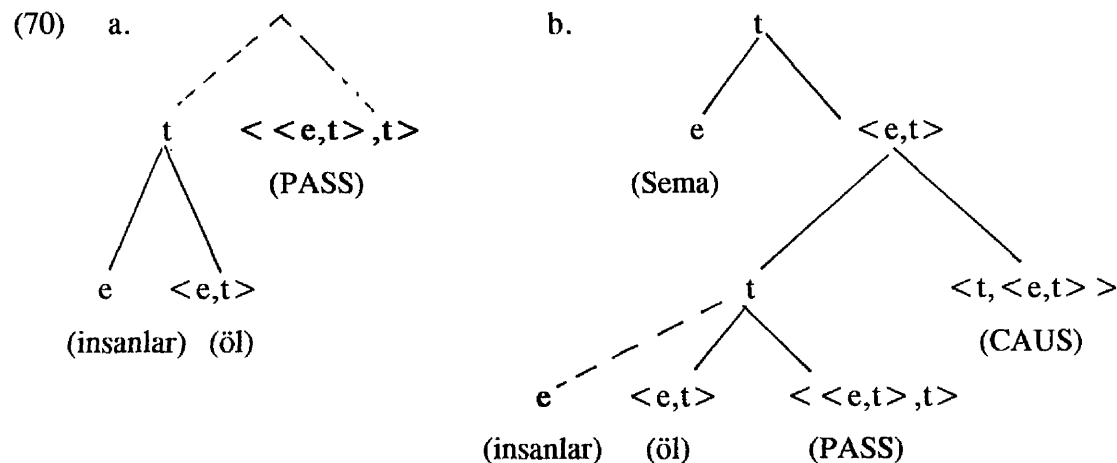


There is nothing in the logic that disallows this: the passive suffix combines as usual and the causative raises to form an adjunction structure, a position which is created by the presence of the passive.

To understand the ungrammaticality of *V-PASS-CAUS* sequences it is illuminating to look at constructions where the root verb is intransitive:

- (69) *Sema insanlar-ı öl-ün-dür-dü.
 (NOM) people-ACC die-PASS-CAUS-PAST.
 Intended reading: Sema caused people to be dead.

The presence of the accusative complement *insanları* 'people(acc)' is imposed by the c-selection properties of the causative morpheme. This is by virtue of the fact that the attachment of the causative to a stem has the effect of adding an argument. But whenever there is an accusative complement in a causative sentence in Turkish, it is interpreted as an argument of the root verb, in this case an external argument, following from the intransitivity of the root verb. However, I concluded above that passives lack external arguments in the logical representation. The requirement of the causative to have a complement clashes with the lack of external arguments in passives:



More specifically, there is no place for such an argument in the logical configuration. The logical well-formedness of a construction depends on the proper combination of types by functional application, together with the nonvacuous contribution of every

element which has a logical type. If, as in (70a), the direct object argument combines with the intransitive verb to form a proposition, the outcoming logical type will be a *t*. This type cannot be predicated of $\langle e, t \rangle$, that is, *t* is not a suitable logical type for the passive (an $\langle \langle e, t \rangle, t \rangle$) to combine with, so the sequence will be ruled out. If on the other hand the root verb combines directly with the passive as suggested here, there will be nothing in the logic that represents the argument *insanlar* 'people', as (70b) illustrates. In fact, to my knowledge, *V-PASS-CAUS* sequences with intransitive root verbs are universally ruled out. Notice that the logical properties of the causative morpheme permit it to combine with a *V-PASS* sequence irrespective of the transitivity of the root verb. It is the addition of an extra argument that makes the combination an impossibility.

As for the ungrammaticality of *V-PASS-CAUS* sequences with transitive root verbs, I will suggest in the following chapters that a solution should be sought in language specific properties of case markers. The explicit nature of the processes involved will be made clear in those chapters, especially in sections 4.32, 5.22 and 6.1. The main reason against being explicit about case at this stage is the inability to express its properties in this framework, and this fact will be central in the argumentation for the need to shift to a different logical discipline. Here I shall merely reflect upon the intuition behind taking case properties as a filter on interpreting the relation between arguments and predicates. The case marker on each NP is what guarantees an argument one position in a logical configuration, rather than another. The internal argument of the root verb has nominative case marking in sentences with *V-PASS* sequences. It is not surprising, then, that sentences like (71a) are ungrammatical. Since *bu ev* 'this house' is the internal argument of the verb *yap* 'build', it should be nominative. But in (71a) it has accusative case marking, a case which does not indicate this relationship. Now suppose that *bu ev* 'this house' is taken to be nominative as in (71b):

- (71) a. *Sema bu ev-i yap-ıl-dır-dı.
 (NOM) this house-ACC build-PASS-CAUS-PAST
 (Attempted reading: Sema had this house (be) built.
- b. *Sema bu ev yap-ıl-dır-dı.
 (NOM) this house-nom build-PASS-CAUS-PAST.

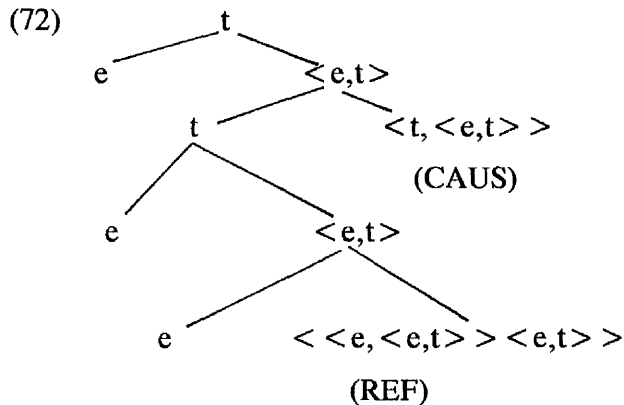
This sentence, which is ungrammatical, can immediately be ruled out on the grounds that Turkish (non-complex) sentences cannot have double nominatives. The difference between Chamorro and Turkish, then, could be attributed to a difference in the properties of case markers.⁴³ This suggestion supports earlier claims that properties of case markers vary from one language to another. A factor that might be significant is the impossibility of the passive occurring with the accusative case-marker in Turkish,⁴⁴ whereas in languages that have *V-PASS-CAUS* sequences, it is exactly the case that those languages allow accusatives in passives. As I have not yet specified a means of explicitly representing case-marking in the logical configuration, I shall leave this topic to Chapter V in which such a mechanism will be developed.

2.2362 Causative/Reflexive

The combination of a causative complex verb with the reflexive is correctly ruled out by the logical types. Since the reflexive is of type $\langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$, it needs a two place predicate. The causative, however, being of type $\langle t, \langle e, t \rangle \rangle$ provides a one-place predicate, a type which the reflexive cannot combine with. Here we see that specifying the causative as a $\langle t, \langle e, t \rangle \rangle$ rather than a type which has a "transitive" output, say an $\langle \langle e, t \rangle, \langle e, \langle e, t \rangle \rangle \rangle$ or an $\langle \langle e, \langle e, t \rangle \rangle, \langle e, \langle e, t \rangle \rangle \rangle$ is advantageous again. If we had specified it as a transitivity, or simply a type with a transitive output, it would incorrectly combine with the reflexive.

The reflexive complex predicate, on the other hand, does combine with the

causative suffix, respecting the type specifications of these suffixes. The combination of the reflexive with a root verb gives an $\langle e, t \rangle$ which when combined with an argument provides a t , the type that a causative requires:



Surprisingly however, the outcome is ungrammatical in Turkish:

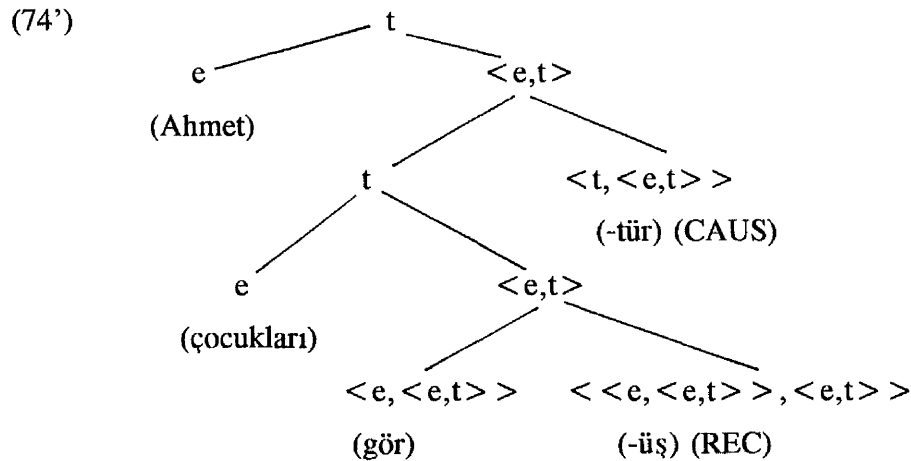
- (73) *Çocuk-u giy-in-dir-di-m.
 child-ACC dress-REF-CAUS-PAST-1
 I made the child dress itself.

As in **V-PASS-CAUS* sequences, I shall attribute this ungrammaticality to the role of the accusative case marker and the presence of the NP which bears this case. I shall therefore return to this problem in Chapter V.

2.2363 Causative/Reciprocal

V-CAUS-REC sequences are disallowed for the same the same reason as *V-CAUS-REF* sequences: $\langle e, t \rangle$, the output of the causative, is incompatible with the input the reciprocal requires. *V-REC-CAUS* sequences on the other hand, are grammatical, as is predicted:

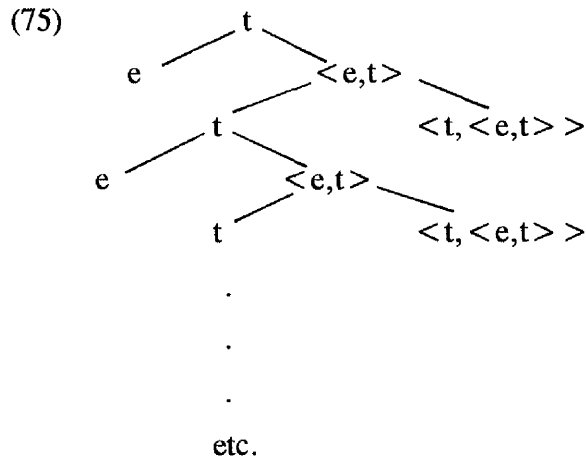
- (74) Ahmet çocuklar-ı öp-üş-tür-dü.
 children-ACC kiss-REC-CAUS-PAST
 Ahmet made the children kiss each other.



The reciprocal suffix *-üş* which requires a two-place predicate combines with *gör* 'see', yielding a one-place predicate. The combination of this with the argument *çocuklar* 'children' provides a *t*, the type that the causative combines with.

2.2364 Causative/Causative

The attachment of an additional causative suffix with the effect of additional causativity has usually been cited in the literature as a common and productive construction in Turkish. This combination is allowed by the type specification of the causative suffix, as illustrated below:



The problem, however, is not of generating these configurations from the point of view of the combinatorial properties of the causative suffix, but to disallow the combination after one, perhaps two concatenations. This is necessary because each occurrence of the causative morpheme creates the position for an additional argument which would require these arguments to be expressed at Surface Form. There are also other languages in which causative doubling seems to take place. Examples of triple causatives are reported in languages like Western Pomo (Oswalt 1977) where these constructs are interpreted as displaying the whole array of argument structure each causative requires. However the examples that are cited are single words which lack the full array of arguments, thus making it impossible to substantiate the claims that the affixes are present with their logical structure.⁴⁵ As for Turkish, although constructions with double causatives are grammatical, they are not so common, and in the absence of strong pragmatic pressure they are interpreted as single causatives. In fact, sequences of multiple causatives occurring with their full array of causees are ungrammatical in Turkish exactly for this reason: as the output of the causative requires an argument, there ought to be ways in which these multiple causee NPs get expressed which, in turn, would require either a separate case-marker for each causee indicating its relation to the verbal complex, or, in cases where the same case-marker is used, there would have to be word order restrictions to guarantee the correct interpretation. The number of case markers is finite

(as opposed to the recursive applicability of the causative suffix), moreover, word order restrictions in Turkish are not stringent enough to handle cases of more than two identical co-occurring case markers. Let us illustrate. First consider (76) with a sequence of four causatives:

- (76) Yıka-t-tır-t-tır-dı-m.
wash-CAUS-CAUS-CAUS-CAUS-PAST-1

This sentence does not mean *I caused x to cause y to cause z....to wash (something)*, but instead *I caused x to wash (something)*, and probably *I caused x to cause y to wash (something)*.⁴⁶ It is quite clear that in such constructions the causative applies vacuously (i.e. with no logical type specification but only with the consequence of emphasising the causativity) starting from the third perhaps even the second occurrence.

Now consider the following sentence with two causatives:

- (77) Başbakan sokaklar-ı temizle-t-tır-di.
prime minister streets-ACC clean-CAUS-CAUS-PAST
The prime minister had the streets cleaned.

If we were to provide an overt causee it would have to be in the dative case since the root verb is transitive. This causee could act as the logical subject of either of the occurrences of the causative:

- (78) Başbakan bakanlar-a sokaklar-ı temizle-t-tır-di.
prime minister ministers-DAT streets-ACC clean-CAUS-CAUS-PAST
(i) The prime minister had the ministers make someone clean the streets.
(ii) The prime minister had someone make the ministers clean the streets.⁴⁷

Now inserting a second causee makes this sentence considerably difficult to parse, though acceptable by some speakers:

- (79) Başbakan bakanlar-a sokaklar-ı temizle-t-tir-di çöpçüler-e.
 P.M. ministers-DAT streets-ACC clean-CAUS-CAUS-PAST dustmen-DAT
 (i) The prime minister had the ministers make the dustmen clean the streets.
 (ii) The prime minister had the dustmen make the ministers clean the streets.⁴⁸

Three or more occurrences of the causative suffix with all the causees present is not parsable:

- (80) *Başbakan bakanlarına muavine çöpçüleresokaklarıtemizle-t-tir-t-ti.
 P.M. ministers-DAT administrator-DAT dustmen-DAT streets-ACC clean-
 CAUS-CAUS-CAUS-PAST

The fact that the multiple occurrence of the causative suffix depends on the case-marking properties of Turkish is further supported by causatives of intransitives. Recall that such verbs use the accusative case to mark the (first occurrence) of the causee. For the second and following causees, the dative case is used. Now it is interesting that constructions with three causees where the root verb is intransitive are considerably better than sentences like (80):

- (81) Su-yu Ali-ye ak-ıt-tır-t-tı-m .
 water-ACC -DAT flow-CAUS-CAUS-CAUS-PAST-1
 I made (Ali) make the water flow.

The difference can be schematised as follows:

	<u>1st causee</u>	<u>2nd causee</u>	<u>3rd causee</u>	<u>4th causee</u>
TR V	DAT	DAT	*DAT	*DAT
INT V	ACC	DAT	DAT	*DAT

This indicates that the possibility of parsing a sentence depends not on the number of the causative suffixes, but rather on the number of occurrences of identical case markers, in this case the dative. Another factor which is significant is that the vacuous application of the causative may start with its second occurrence where the root verb is transitive (as in (82a)), as opposed to the obligatory logical presence of the second occurrence of this affix with intransitive roots verbs (as in (82b)):

- (82) a. Yer-i yıka-t-tır-dı-m.
 floor-ACC wash-CAUS-CAUS-PAST-1
 (i) I made someone make someone wash the floor.
 (ii) I made someone wash the floor.
- b. Su-yu ak-ıt-tır-dı-m .
 water-ACC flow-CAUS-CAUS-PAST-1
 (i) I made someone make the water flow.
 (ii) ?*I made the water flow.

That is, the second occurrence of the causative can be overlooked more easily in constructions with transitive root verbs than in those with intransitive verbs.⁴⁹

These observations indicate that the factor determining the number of applications of the causative is not the logical properties of this suffix, but the interaction of one of its consequences, namely the creation of argument positions, with language-specific properties of case-marking.

2.2365 Passive/Passive

Turning now to *V-PASS-PASS* sequences, we can easily see that these are ruled out by the logical type assigned to the passive morpheme. The passive, being of type $\langle \langle e, t \rangle, t \rangle$ requires an item of type $\langle e, t \rangle$, but a verbal complex which is *V-PASS*

is of type *t*. Therefore it is impossible to combine a passive with a passive. These sequences, however, are considered acceptable by some speakers:⁵⁰

- (83) 1 Mayıs-ta Taksim-e gid-il-ir-se vur-ul-un-ur.
 1 May-LOC Taksim-DAT go-PASS-AOR-COND shoot-PASS-PASS-AOR
 If (one) goes to Taksim on May 1st, (one) (be) shot.

This being the case, the only way to generate a well-formed Logical Form for these constructions would be to resort to type-lowering. If this were to happen, the first instantiation of the passive suffix would be of type *e*, arbitrarily allowing two type specifications for the passive, with the further stipulation that type lowering should apply only to the first instantiation only. Not only would this kind of type lowering be totally arbitrary, but such a process is in any case debarred because one cannot logically deduce *e*, given $\langle \langle e, t \rangle, t \rangle$.⁵¹ We must therefore abandon this option, and admit that the type-specification of the passives incorrectly rules out the well-formed *V-PASS-PASS* sequence. I return to this problem shortly.

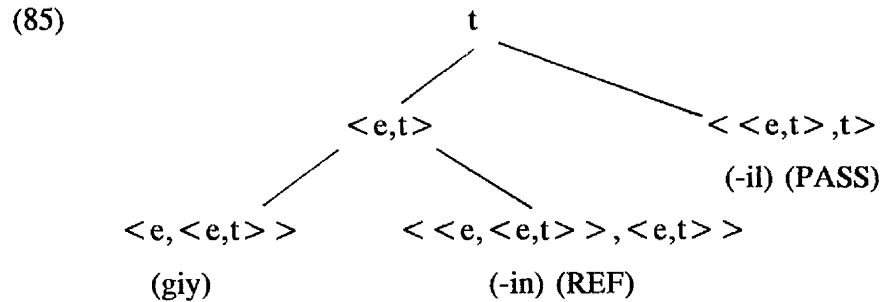
2.2366 *Passive/Reflexive*

By contrast, logical type specifications provide the desired results with respect to *V-PASS-REF* and *V-REF-PASS* sequences. The first is correctly ruled out, while the second is correctly permitted. Consider the following sentences:

- (84) a. *Giy-il-in-di.
 dress-PASS-REF-PAST
 b. Giy-in-il-di.
 dress-REF-PASS-PAST⁵²

(84a) is ungrammatical because the type the reflexive requires, $\langle e, \langle e, t \rangle \rangle$, is not

provided by the combination of the passive, which is t . (84b), on the other hand is well-formed, as illustrated below:

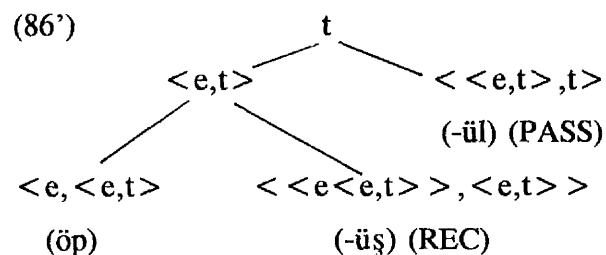


The combination of the reflexive with a two-place predicate yields the type $\langle e,t \rangle$ which is the proper logical type for the passive to combine with. The type specification in this case provides the desired outcome in both instances.

2.2367 Passive/Reciprocal

Similarly, the occurrence of the reciprocal inside the passive (*V-REC-PASS*) results in a well-formed formula, since the output of the combination of the reciprocal with a verb provides the type that the passive can combine with. This, indeed, reflects the well-formedness of the sequence in (86) where the reciprocal precedes the passive:

- (86) öp-üş-ül-dü
 kiss-REC-PASS-PAST
 There was a (mutual) kissing.

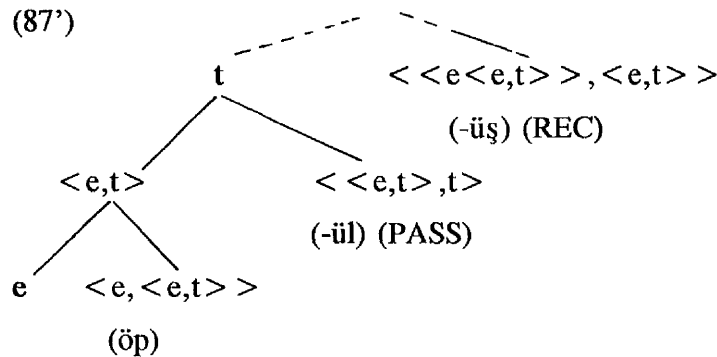


The logical specification of the reciprocal allows it to combine directly with the root verb, the output of which is the type that the passive requires.

The reverse of this sequence, where the passive morpheme is closer to the verb than the reciprocal is ungrammatical:

- (87) *öp-ül-üş-tü
kiss-PASS-REC-PAST

It turns out that logically, too, this sequence cannot map onto a well-formed formula:



The reason for this is that the reciprocal has to adjoin to the logical type of a transitive verb. The only suitable contender is the root verb. But that has already combined with the passive. The reciprocal needs an $\langle e, \langle e, t \rangle \rangle$ to combine with, but the only available element is of type t which is unsuitable for further combinations.

In fact, *V-PASS-REC* sequences are reported to be ill-formed in all languages (Alsina 1990). The logical properties of the passive and the reciprocal as they are characterised here captures this generalisation.

2.2368 Reflexive and reciprocal combinations

The four possible sequences (*V-REF-REC*, *V-REC-REF*, *V-REF-REF*, *V-REC-REC*) are all correctly ruled out by their type specification. The reason for all these is the same:

these suffixes turn two-place predicates into one place predicates, and if one of these is already present, then there is no suitable type for the second one to combine with.

2.24 Summary of lexical specifications

The lexical specifications of the morphemes discussed so far are given below.

(88)	c-selection	s-selection	Meaning Postulates
- <i>ler</i> (pl)	[NP____] _{NP}	< e, e >	
-(<i>s</i>) <i>i</i> (nc)	[N'____] _{NP}	< < e, t >, e >	
- <i>dir</i> (caus)	[V____] _v	< t, < e, t > >	
- <i>il</i> (pass)	[V____] _v	< < e, t >, t >	
- <i>in</i> (ref)	[V____] _v	< < e, < e, t > >, < e, t > >	$\frac{P(X)(X)}{\forall x P(x)(x)}$ $x \in X$
		$\lambda V \lambda u [V(u)(u)]$	
- <i>is</i> (rec)	[V____] _v	< < e, < e, t > >, < e, t > >	$\frac{P(X)(X)}{\forall x \exists y P(x)(y)}$ $x \in X \ y \in X$
		$\lambda V \lambda u [V(u)(u)]$	

Below is a summary of the result of all possible combinations as predicted by type specifications.

(89) Type specifications

<u>correctly disallow</u>	<u>correctly permit</u>	<u>incorrectly permit</u>	<u>incorrectly disallow</u>
V-CAUS-REF	V-CAUS-CAUS	V-PASS-CAUS	V-PASS-PASS
V-PASS-REF	V-CAUS-PASS	V-REF-CAUS	
V-REF-REF	V-REC-CAUS		
V-REC-REF	V-REF-PASS		
V-CAUS-REC	V-REC-PASS		
V-PASS-REC			
V-REF-REC			
V-REC-REC			

2.3 From Licensing Grammar to Labelled Deductive Systems

The analysis of complex predicates above displayed certain recurring problems which warranted closer scrutiny. I shall now look at the specific points at which the analyses ran into problems and see whether they can actually be solved within the framework of Licensing Grammar. We can group these problems as follows:

1. Drawbacks of type specifications
2. The representation of case marking
3. Mode of combination
4. The status of S-structure

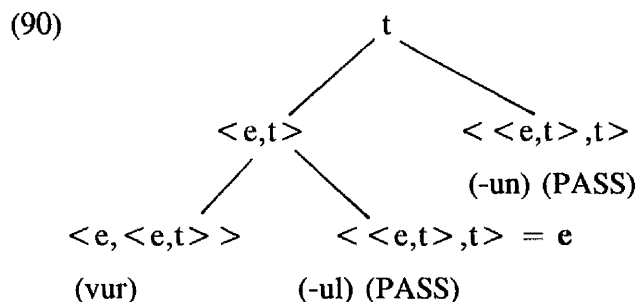
We take each one in turn.

1. Drawbacks of assigning types

We concluded section 2.24 by pointing out that type-specifications (i) incorrectly permitted two ungrammatical sequences (*V-PASS-CAUS*, *V-REF-CAUS*) and (ii) incorrectly disallowed grammatical *V-PASS-PASS* complexes. A closer look at (i) indicates that we actually want these sequences to be generated by logical types on general conceptual grounds: these sequences are paraphrasable, and their logical well-formedness is supported by the fact that at least one of them (*V-PASS-CAUS*) does occur in some languages, such as Kinyarwanda and Japanese. *V-REF-CAUS* sequences, although to my knowledge unattested, are also logically possible sequences, the lack of which can be attributed to accidental factors. That is, both sequences are interpretable and both map onto a well-formed Logical Form, as opposed to, say, *V-REC-REC* or *V-REF-REF* sequences which are uninterpretable.⁵³ This leaves us with two choices: either to assign a different type to the affixes in question so that these constructions can be ruled out by lexical specifications specific to Turkish, or to keep the type specifications as they are and attribute the ungrammaticality to language-particular factors interacting with type specifications. The first alternative would be highly undesirable because it would mean sacrificing cross-linguistic (as well as language-internal) generalisations. The second alternative would force us to search for other factors specifically ruling out

this combination in Turkish. In sections 2.2361 and 2.2362 it was implied that the ungrammaticality was due to the clashing case-marking requirements between the causative and passive/reflexive morphemes. That is, the application of the passive/reflexive "suppresses" the accusative case which the causative requires. Now the impossibility of the accusative case occurring with the passive is a language-specific property. Japanese passives do allow an accusative marked NP, and therefore there is no contradiction between a verb combining first with the passive and then with the causative, as mentioned above.⁵⁴ It seems then that the second alternative, that of attributing the ungrammaticality of *V-PASS-CAUS* and *V-REF-CAUS* sequences to case considerations is the better one. Unfortunately, type-theory alone does not allow us the flexibility for characterising these phenomena. As will be shown in the following subsection, assigning a specific type to each case marker creates empirical problems which cannot be handled unless certain generalisations are sacrificed.

As for the case of undergeneration relating to *V-PASS-PASS* sequences (cf. section 2.2365), these display the most important drawback of assigning type-specifications as the sole means of constructing Logical Form. Assigning the type $\langle \langle e, t \rangle, t \rangle$ to the passive morpheme was shown to work in this case only if the additional mechanism of type-lowering were incorporated into the system. As mentioned above, this is not an option because type-lowering in the case of $\langle \langle e, t \rangle, t \rangle$ is not logically provable. Note however that for complex types (such as transitive verbs) this option may be open (cf. van Benthem 1986). But even assuming for the sake of argument that type-lowering were possible, *V-PASS-PASS* sequences would still be problematic, simply because this mechanism would have to be allowed for only one, and moreover the first, instantiation of the passive. Otherwise *vur* 'hit', below, being a transitive verb could not combine with the passive, since it lacks the argument which will turn it into an $\langle e, t \rangle$, the type that a passive can combine with. This is illustrated below for the relevant segment:



This reduces type shifting to an unrestricted and what turns out to be a stipulatory process. It would be highly improbable that natural language would employ such a mechanism.

Notice that apart from the above disadvantages, the characterisation of the passive as $\langle \langle e, t \rangle, t \rangle$ presents an additional risk. This is the type which is assigned to NPs in standard Montagovian analyses. We would then be equating the passive morpheme with an argument, a stance which is not uncommon in some GB analyses (cf. Roberts 1987, Fabb 1988, Baker, Johnson and Roberts 1989). There are a few immediately observable asymmetries between NPs and the passive morpheme which would make it highly undesirable for these to be treated in a uniform manner. To mention just one, only the former is case-marked and morphologically unbound, whereas the latter is usually bound, and is not case marked. We shall look at these properties in more detail in Chapter V.

As a consequence of the characterisation of the passive along the lines suggested here, we are in a way forced to have sentences without external arguments not only in the logic, but in the case of intransitives, also at surface structure. Simply lacking a surface subject is not a problem for any theory. In GB for example, since subject NPs are in the specifier position of the IP, they are optional. However, lacking an external argument at the level of logical representation creates problems in terms of Predication Theory (Rothstein 1983). Notice that the same problem exists in some other models.

For example, some verbs in Marantz (1984) are specified as being [-log sub], and ergative verbs in Burzio (1986) do not have external arguments either. This is a general problem which should be avoided if logic is understood to be a transparent reflection of the interpretation of utterances.

Finally, the type specifications assigned to derivational morphemes indicate that there is an asymmetry in the combinatorial process. The asymmetry lies in the fact that the causative and the passive require the root verbs to fulfil their logical specifications first, whereas the reflexive and the reciprocal combine directly with the verb. At first glance there doesn't seem to be a particular problem with such asymmetries. The type specification of predicates does not require directionality to be encoded in them, because, unlike in standard versions of Categorical Grammar, the type specification spells out the procedure in which the combination is to take place irrespective of order. The problem is that two very similar processes, passivisation and reflexivisation create structures which are totally different from one another. Considering that they are both argument reducers, this shared property is totally opaque in our characterisation. The causative and the passive, on the other hand, are two very dissimilar processes but this time their mode of combination does not capture this fact. In short, the logical type specifications and the combinatorial process driven from these obscure any similarities or dissimilarities in the function of the grammatical function changing morphemes.

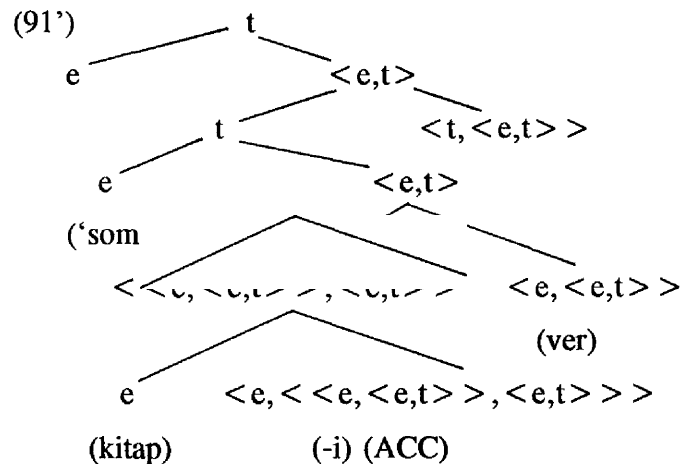
2. Drawbacks of representing case as a type

In a number of representations above, we came across case-marking as a key factor in deriving the correct interpretation. In order to provide a mapping between an NP and a specific slot in a logical configuration we need an explicit means of characterising case. For example, given that in a causative construction there are two or three or even four such NPs, the correct interpretation of a sentence relies on these NPs occurring at their intended places at Logical Form. What guarantees this is the case marker on each NP, which directs its adjacent argument to one specific position.

We said above in 2.232 and 2.233 that Intensional Logic did not provide a means of expressing case marking explicitly. In principle, it is possible to specify case markers as having logical types. Under this assumption an accusative case marker would be $\langle e, \langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle \rangle$.⁵⁵ But even this first attempt fails. Consider two of the instances where the accusative is used:

- (91) a. Ahmet kitab-ı ver-dir-di.
book-ACC give-CAUS-PAST
Ahmet made someone give the book.
- b. Ahmet kitab-ı düş-ür-dü.
book-ACC fall-CAUS-PAST
Ahmet made the book fall.

The specification of the accusative case given above creates a proper combination for the lexical items in (91a):



The logical type of the NP *kitab* combines with the accusative to give a type which when combined with a two-place predicate yields a one-place predicate. The rest of the

combination takes place as usual.

Consider now the Logical Form for (91b). Again the logical type of the NP *kitap* combines with the accusative case marker, the outcoming type being one which when combined with a two-place predicate yields a one-place predicate. However this time all there is available is a one-place predicate *düş* 'fall', and not the required two-place predicate. Therefore the combination cannot proceed. In such cases one might be tempted to resort to something like reanalysis, whereby *V-CAUS* would be reanalysed as a two-place predicate. But this again is a highly unrestrictive move losing all generalisations pertaining to causativity. This simple example shows that characterising case markers as having specific logical types cannot be used as a mechanism, a conclusion which also has consequences for the illicit *V-PASS-CAUS* and *V-REF-CAUS* sequences for which we essentially require a proper characterisation of case.

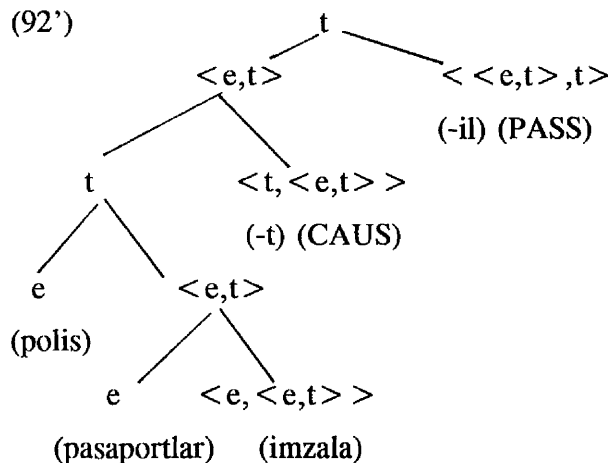
3. Mode of the combination

The way I characterised constructions with derivational morphemes relied crucially on a bottom-up procedure in the combinatorial process. This was not driven by choice but by the way in which affixes attach to form complex words. Turkish being a language where suffixation is the only means of complex word formation, starting from the leftmost item seems to be the only alternative for a combinatorial mechanism. The combinatorial requirements on a sequence of morphemes *x-y-z*, then, would necessitate that the morpheme *x* enter the combinatorial process first. Such a pattern would mean that each affix in Turkish combined with the immediately preceding morpheme only after this morpheme fulfilled its logical requirements. In single instantiations of the causative and the passive we observed this to be the case. Both the causative and the passive affixes combine with the root verb after the root verb has combined with its argument(s). However, the reflexive and the reciprocal, in effect, prevent the root verb from fulfilling its requirements. Let us illustrate. Take a sentence with a reflexive complex predicate. The type specification of the root verb has to be $\langle e, \langle e, t \rangle \rangle$ (due

to the requirement of the reflexive suffix), and the reflexive is of course $\langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$. Now if the combination followed a left-to-right order, the root verb would apply to its subject first, yielding the type $\langle e, t \rangle$. This is a type which the reflexive cannot combine with. Thus the combination respecting the linear sequence fails. To accommodate such constructions, the left-to-right mode of combination would have to be overridden by other requirements. In effect, we would virtually be claiming that linear order is a useful mechanism which can handle certain occurrences of derivational morphemes, but which can be abandoned if it fails. It is obvious that such a move would relax the conditions on the mapping between Surface Form and Logical Form in an unprincipled manner, while at the same time being too powerful.

An even greater problem arises in sequences of derivational morphemes, as mentioned in section 2.2361 (65a), repeated below. Consider the following:

- (92) Pasaportlar polis-e imzala-t-il-dı.
 passports police-DAT sign-CAUS-PASS-PAST
 The passports were made to be signed by the police.



The causative requires a t which is straightforwardly provided by the combination of the

root verb with its arguments. And the passive adjoins to the node created by the causative. But what happens to the passive at the point where the causative adjoins? Is it still attached to it, and if so, how can the complex type specification of *-t-il* 'CAUS-PASS' be hosted under a node which can only contain $\langle t, \langle e, t \rangle \rangle$? And then how can the presence of a complex node which is there neither by lexical specification nor as the output of a combination be maintained? In fact one does not even have to go as far as sequences of derivational morphemes to understand that there is problem. As indicated previously, the presence of inflectional elements is the first warning that a bottom-up mechanism cannot be sustained. Taking, say, a V-CAUS-TNS sequence, what does one do with the tense affix at the point where the causative is combining? Such considerations show that a bottom-up pattern in mapping Surface Form to Logical Form is impossible to implement unless one is prepared to introduce derivations within Logical Form with intermediate levels, or else lose the descriptive power of type specifications altogether. Both options would bring us back to the point we started from: a grammar which requires too many mechanisms but explains relatively little.

4. *The status of Surface Form*

I have been saying all along that Surface Form is flat and the representation of argument structure does not require configurationality to be part of this level of representation. Impoverishing Surface Form in favour of a highly configurational Logical Form is a direct consequence of the non-isomorphism between these two levels, and technically there is no problem in attributing a flat structure to one of these levels in this framework. But a closer consideration of the issues indicates that we do not even need a flat structure. Flatness, after all, is a notion that is relevant to structural hierarchy. Nothing in what we have seen so far required us to attribute any kind of hierarchy to Surface Form. As a consequence, what is required is a characterisation of the order in which lexical items occur. In what follows, I shall pursue the idea that insofar as one can refer to a surface form, this is simply a left-to-right succession of units of information.

2.4 Conclusion

The points outlined above as shortcomings of Licensing Grammar are a direct outcome of the limited expressive power of the formalism we have been using, in particular in allowing a multiplicity in lexical representations and an infinite inventory of types.⁵⁶ Although type assignment is an integral part of logical representations, it ought to be clear by now that the greatest problem in providing logical representations is the inadequacy of type-theoretic notation as the sole means of inducing structure at Logical Form. This is an indication that a different kind of logic is needed. It should also be noted that however much one tries to attribute configurationality to Logical Form in favour of a less configurational Surface Form, the notion of configurationality remains split between the two levels, often generating redundancy in structural descriptions.

In order not to lose the perspective, what we have conceived of so far as shortcomings of Licensing Grammar ought to be seen against the background of other factors that indicate the need for a change in our understanding of grammar. Recent work conducted on a number of aspects of natural language (anaphoric dependencies, crossover phenomena, WH-expressions, cf. Kempson 1989, 1990a, 1990b, Gabbay and Kempson 1991, 1992) provide evidence that utterance interpretation is not a static process whereby a natural language string is mapped onto a predetermined format, but is instead a dynamic and procedural enterprise using as input linguistic expressions which are to a large extent underdetermined with respect to their truth conditions, and systematically relying on extra-linguistic factors for interpretation. Such a procedural process draws on information which standard analyses treat as falling within the remit of incompatible fields. However, I shall take it to be a working hypothesis that logical, syntactic/configurational and pragmatic factors all play a role in utterance interpretation concurrently.

We now have a basis on which we can make the following claim: natural language strings embody the information relevant to building highly configurational

structures, where these structures form a part of general reasoning. The process of interpretation then turns out to be a reasoning phenomenon. This claim has the following immediate consequences with respect to the components of grammar:

1. The need for two separate but concurrent structural representations, or a multi-stratal component where one level is derived from another is unwarranted.
2. Lexical information is designed in a format recognisable by the logic, this allowing for a range of properties to be part of lexical specifications.

In the following chapter I turn to a model which characterises the content of natural language as logic and a lexicon which is commensurate with such a logic.

NOTES

1. For other arguments in support of LF see Hornstein 1984, Hornstein and Weinberg 1990.
2. The various criticisms of LF range from its status as a derived level (Brody 1991) to its descriptive content (Hintikka 1989) and explanatory power (Williams 1986). More specifically, Brody argues on the basis of chain formation that LF is the input to D-structure with S-structure mediating between the two. Hintikka suggests that the way LF is defined allows for only the expression of first order predicate logic (see also May 1989), and Williams questions the explanatory power of this level in the face of it being a mixture of reconstructed and non-reconstructed forms. There is a vast literature on LF, and the reader is referred to Berman and Hestvik (1991) for a survey of this.
3. Following discussions in the literature about the degree to which the human biological system is parsimonious, Chomsky (1991b) argues that there is no reason to assume that the language faculty is economical. Current linguistic research though, almost exclusively takes parsimony as the most substantial evaluative measure and I shall also adhere to this view here.
4. The claim that affixation precedes compound formation is based on the assumption that affixes can only attach to words. Hence a compound which contains an affix is formed by the combination of two words, one of them with an affix.
5. A much more recent approach which explores relatedness is Anderson (1992). I shall not go into the details of this analysis here, although it may have important implications for word formation.
6. In a recent article, Sproat (1992) claims that *unhappier* does not display bracketing paradoxes. The reason for this is that *-un* does not appear to have properties identical to *not*, and *unhappy* is not a paraphrase of *not happy*. Although this may be the case, I shall nevertheless use this construction to illustrate the point. As Sproat concludes, this does not mean that bracketing paradoxes are all non-cases, and the problems remain.

7. There are cases where one might consider movement to be obligatory for reasons of interpretation. Kitagawa (1986) suggests that movement of Japanese adverbials is obligatory for reasons of scope in cases where the phonological representation forces them to occur in adjectival positions.

8. Another approach to bracketing paradoxes is provided by Sproat (1985-86) who claims that the problem disappears once it is stated in terms of adjacency and precedence relations. Together with a formulation of precedence and adjacency which alters the bracketing convention, there is also a rule which translates adjacency into precedence. Since this solution is stipulatory, I will not go into the details here. See Göksel (1988).

9. The variants of the nominal compound marker are *-si/-sı/-sü/su/-i/-ı/-ü/-u*, and those of the plural suffix are *-ler/-lar*.

10. Not all compounds which have idiosyncratic meaning follow this pattern and a few have the expected order of the plural marker following the nominal compound marker. *Kahve-reng-i* (coffee-colour-NC) 'brown' has the plural form as *kahvereng-i-ler*. The existence of such forms may be due to the outcome of the change in the properties of the nominal compound marker. It may be the case that *-si* is at a stage of transition that is affecting the suppression of its lexical properties, which would be expected since its occurrence is becoming less frequent in some dialects of spoken Turkish.

11. One possible objection to using bracketing paradoxes as an indication that LF cannot be derived from S-structure is the following: how can one take morphological processes to fall under a generalisation devised for syntactic processes since LF has specifically been motivated to explain the scope of quantifiers and anaphoric dependencies? Although scope plays a part in the examples given above, bracketing paradoxes should be the subject of morphological investigations; it is therefore inappropriate to use them as arguments against a level motivated for syntax. The answer to such objections is that the versions of GB which are relevant to issues discussed in this work do not have a sophisticated morphology theory which takes morphological structure as distinct from syntactic structure. Insofar as morphology is investigated, it is taken to be on a par with

syntax (except for a few works such as Di Sciullo and Willams 1986, and Chomsky 1991b where a partially separate status is attributed to morphology) and has little independent status, with word internal elements being subject to the similar constraints as free morphemes (cf. Baker 1988, Pollock 1989). I therefore see no contradiction in using morphology for examining GB syntax, since unifying morphology and syntax is by now common practice in GB.

12. This view is similar in spirit to works that assign parallel structures to bracketing paradoxes and do not derive one level from the other (cf. Sadock 1991, Lieber 1992). The theoretical claims of these works and the structure of grammar they propose are very different from the one presented here, and the issues are too broad to be summarised under bracketing paradoxes.

13. Following the analysis of INFL in Chierchia (1988), we are assuming that this category is of a type which combines with a property to give a one-place predicate, an intransitive verb itself being assigned the type of a property *p*. This analysis is assumed for purposes of exposition only and does not have theoretical consequences in later analyses.

14. Koopman and Sportiche (1991) suggest that the subject is base generated in a VP internal position (higher than any objects) and parameterised with respect to its position at S-structure. In some languages it raises to the SPEC of INFL, in others, it remains in situ. The part of this analysis relevant to the discussion below is the hierarchical prominence of the subject, wherever it may be base generated.

15. The grammaticality judgements of the sentences Kornfilt gives show a polarity which does not match my own judgements. However, I agree that leaving out a segment of a VP constituent is slightly worse than leaving out the VP.

16. I shall return to the Projection Principle in section 7.21.

17. A case in point is constructions without an object in generically construed sentences such as *He criticises mercilessly* and in stylistically restricted phrases such as *stir briskly*. The status of such constructions will not be analysed here.

18. I shall ignore intensionality.

19. There are languages such as Greenlandic (cf. Woodbury 1977) where the overt expression of an object has to be marked by a suffix on the verb, and when this suffix is not present a transitive verb cannot have an overt object. Such a language would have the same representation as a transitive verb in Turkish with the additional characterisation of the suffix which makes it possible for the object to appear.

20. The unexpressed arguments can be recovered from discourse, this being specified by the Principle of Relevance. Consider a context in which a meeting with the director of the school is significant for both Mary and John and it is mutually manifest that this is so. In a conversation taking place between John and Mary later on it is perfectly acceptable for John to reply *Gördüm*. 'I saw' to Mary's question 'What happened?'.

21. We shall not go into an examination of 'propositional form' here, which, in earlier work on Licensing Grammar (cf. Kempson and Matthews 1986) was taken to be the level which took logical form as input. Logical form and propositional form receive a unified treatment under L(abelled) D(eductive) S(ystems) which we shall discuss in the following chapter.

22. For an evaluation of grading grammaticality see Kempson and Matthews (1986).

23. It is also suggested that there might be lexical specifications relevant only at LF; for example Chomsky (1986a) states the difference between *likely* and *probable* in terms of the different selectional properties these have at LF.

24. The difficulty of analysing *-(s)i* is partly due to the fact that it is a marker that changes infinitivals to existential expressions (cf. Kornfilt 1990b). There are also independent problems relating to the analysis of infinitivals (cf. Chierchia 1984).

25. We are here making the assumption that NPs are of type *e* (contra the Montague program). In part this is because in the logic of LDS which I shall turn to subsequently, there is no need to represent NPs as higher types.

26. There is also the possibility of the first noun in a nominal compound being an adjective. This seems to be plausible on the following grounds: adjectives in Turkish syntactically behave like nouns in that they can combine with case markers. And semantically they denote a property of the noun just like the first noun of a nominal compound. However in this case, adjectives and nouns differ, as the nominal compound marker only occurs when the first item is a noun, and not when it is an adjective.

27. Not all such compounds bar the double occurrence of *-(s)i*. The compound *Türk Dil Kurum-u* 'Turkish Language Association' is an example where *dil* 'language' cannot take *-(s)i*, as opposed to *Türk Dil-i Araştırmalar-ı Yıllığı* 'Turkish Language Studies Almanac' where all the nouns require one. This is because these two compounds have different combinatorial properties: [_{NP}Türk [_{NP}Dil Kurumu]] and [_{NP}[_{NP}[_{NP}Türk Dili] Araştırmaları] Yıllığı].

28. This is easier to state in LDS as it is a parsing restriction, a "reduce" device indicating that a certain subbox is complete.

29. The function of the causative suffix as a "de-substantive verbal" morpheme is limited to a few colour adjectives, and even in these cases the stem is mostly altered, an indication of non-compositionally formed stems. The suffixes which productively form verbs from adjectives are *-leş* and *-el*.

30. There is great diversity among languages as to what the causative affix can combine with. For example, languages may have more than one kind of causative suffix depending on the category of the root, as is the case in Wappo (Li and Thompson 1977). Alternatively some languages allow the causative suffix only with intransitive verbs, as is the case in Kurdish (Mackenzie 1981) and Labrador Inittut (Marantz 1984, Baker 1988). Such restrictions do not indicate variations in the logical properties of the causative affix, but rather in their c-selectional restrictions which specify that they attach to intransitive root verbs only.

31. Such an account of transitivity is accepted by others. For example Marantz (1984), drawing on Bantu applicative suffixes which can combine with verbs and having the

effect of increasing the number of arguments they take, considers transitivity to be a feature which is not binary valued.

32. Choosing the accusative marked NP instead of the dative marked one depends solely on the distinct function of the case markers. Whether it is possible to represent this choice in Licensing Grammar will be discussed below.

33. For the variants of the passive morpheme see section 5.11.

34. This is a revised characterisation of the passive as it appears in Göksel (1990b, 1991a).

35. More specifically, in standard GB analyses (cf. Chomsky 1981, Jaeggli 1986) the passive is taken to be the output of a movement rule which takes the direct object from its D-structure (VP-internal) position to the Spec-of-IP position, a movement which is forced by the inability of the passive verb to assign case, due in turn, to the case-absorption properties of the passive morpheme. An extension of this property is to analyse the passive morpheme itself as an argument (cf. Roberts 1987, Baker, Johnson and Roberts 1989). This aspect of the analysis seems to assign a similar character to the passive as that in our analysis. The type specification we assign to the passive attributes it the properties of an argument, which is undesirable for reasons to be discussed in section 2.3.

36. This model has individuals which are e , propositional functions which are $\langle e, p \rangle$ (where $\langle e, p \rangle = \langle e_1, e_2, \dots, \langle e_n, p \rangle \rangle$) and third order functors like $\langle \langle e, p \rangle, \langle e, p \rangle \rangle$.

37. Although it is conceptually incorrect to equate a property with any other type, we can nevertheless assume, for purposes of exposition only, that being a saturated verb, a property can be likened to an $\langle e, t \rangle$. Translating (54) into standard type-theoretic notation would roughly mean that a passive is of a type that combines with the logical type of a transitive verb (since it is specified as $\langle e, \pi \rangle$) to give a saturated, intransitive verb. Hence, other differences apart, Chierchia's characterisation of the passive is similar to an intransitiviser, which could be translated into standard type theory notation

as $\langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$, a type that combines with a transitive verb, an $\langle e, \langle e, t \rangle \rangle$, a function from an individual to a function from an individual to a truth value, to give an intransitive verb, an $\langle e, t \rangle$.

38. Verbs like *duy* 'hear', *gör* 'see', for example, cannot reflexivise.

39. An alternative approach would be to assign reflexive formation to the lexicon and claim that it is a lexical process. In our model a "lexical process" as such does not have descriptive content, because configurational aspects of constructions are lexically induced in any case. Also, there are striking similarities between passives and reflexives, and assigning them two processes a non-unitary characterisation would overlook these similarities. This point will be taken up in Chapter V.

40. Note that the variable *u* here is not an individual variable but a meta variable ranging over individuals.

41. Here I have chosen the meaning postulate which corresponds to 'one another' rather than 'each other', for which there isn't a separate lexical item in Turkish.

42. Our position contrasts sharply with the Mirror Principle (Baker 1985). Baker argues that the visible sequential appearance of the morphemes predicts their combinatorial properties as a matter of universal principle. This stance will be criticised Chapter VII.

43. Such cross-linguistic differences in case markers are common. See, among others, Muysken (1989) for the differences between the accusative and genitive cases of Turkish and Quechua.

44. Marcel Erdal (p.c.) pointed out to me that V-PASS-CAUS sequences were grammatical in Old Turkish. If our suggestion is correct, that is, if the ungrammaticality of V-PASS-CAUS sequences is linked to the properties of accusative case marking in Turkish, this would mean that accusative case marking co-occurred with passive constructions in Old Turkish. Whether this is the case needs to be investigated but although we cannot say anything more specific at this stage, claims in Lightfoot (1992)

support the suggestion that there is a connection between the changes that have occurred in case markers and properties of passivisation.

45. Multiple causatives are attested in other languages, but the status of their argument structure is not clear. See section 4.31. In fact it is probably more often the case that in double occurrences of causatives, the logical properties of one gets suppressed. For example, Dubinsky et al (1988) claim that transitive and unergative verbs in Oromo systematically use two causatives with the logical properties of one of them being suppressed.

46. It is reported that some speakers would allow the second causative to have logical content, such that the sentence in (76) could be interpreted as *I caused x to cause y to wash (something)*. Such dialect variations, if they exist, do not solve the problem: we would then have to account for why the causative should be vacuous starting from the third occurrence, rather than from the second.

47. The second reading becomes better if the causee is replaced with a pragmatically more plausible phrase such as *garbage collectors*.

48. The sceptical reader is urged to switch the position of the two causees to see that this is possible given the correct pragmatic setting. Hence

(i) Başbakan çöpçülere sokakları temizlettirdi bakanlarına.

prime minister dustmen-DAT streets-ACC clean-CAUS-PAST ministers-DAT
can be interpreted again as in (78). At this stage we are only interested in the role case-markers play in such constructions, and not in the word order of the constituents which we leave to section 4.41.

49. The representation of the emphatic occurrence of the causative morpheme will be discussed in Chapter IV.

50. I have argued elsewhere that sequences of two passive are disallowed in Turkish (cf. Göksel 1991a). I had based this on the intuition that (i) could only mean 'self-washing took place', and not 'a washing (of others) took place', which would have been the expected reading if both morphemes had been passive.

(i) Yika-n-il-dí.

wash-n-PASS_PAST

It later came to my attention that some verbs allow double passivisation under certain contextual conditions. This is incorporated into the analysis in Chapter V.

51. See the discussion on the drawbacks of assigning types in section 2.3 for why this is not a possibility.

52. I should point out that (83a) is ungrammatical only if *-in* is interpreted as the reflexive. Recall that this morpheme happens to be homophonous with one of the variants of the passive morpheme, and if it is interpreted as the passive then it will be on a par with (83), hence it will mean '(one) dresses' (i.e. a dressing took place). Under the reflexive interpretation of *-in* (84a) is semantically anomalous.

53. There is also a third group such as the logically disallowed V-CAUS-REF sequence. These are disallowed in all languages, yet are interpretable (cf. *I caused myself to wash*). This is, of course, due to the fact that a reflexive anaphor has to be locally bound, and although the reflexive morpheme itself does not induce an anaphor, it induces a variable which has to be locally bound (Capritsa, Göksel and Kempson 1991, and Chapter V).

54. Details of these constructions will be provided in Chapter VI.

55. Again we are choosing the lower type *e* rather than the higher one which is $\langle e, \langle e, t \rangle \rangle$, for the same reasons mentioned above.

56. There are also criticisms regarding the unrestrictedness of the principle of compositionality. For example Landman and Moerdijk (1983) argue that the principle of compositionality is semantically empty because it depends only on the meaning of the parts and the semantic operations used, and not on syntactic concepts like how many nodes the expression contains, nor on derivational concepts (such as how many rules were used in the derivation) and issues like how many variables the translation contains.

CHAPTER III

THE REPRESENTATION OF NATURAL LANGUAGE AS LABELLED DEDUCTION

3.1 Introduction

It was shown in the previous chapter that analysing complex predicates as types fails to provide the mechanisms for representing certain aspects of these constructions. In this chapter I shall suggest that the requisite formalism can be provided by shifting from a static understanding of logic to a procedural conception of building representations. One of the most important aspects of this position is its commitment to characterising utterance interpretation as a goal-oriented deductive process, where the goal is to map a natural language string onto a well-formed construct of logic. Lexical specifications play a major part in fulfilling this goal: they either provide the building blocks of a logical representation, or they contain instructions on building these representations.

The richness of the informative content of lexical entries has significant ramifications for the syntactic structure of logical representations. The fact that lexical entries can contain building instructions means that structure is created incrementally in a step-by-step fashion. There is no syntactic template prior to a representation such that its slots are filled by lexical items. By contrast, slots are created only if required by the lexical specifications in the string. Such a model has the following advantages. The design of the model reflects the Relevance-theoretic conception that utterance interpretation is part of a general cognitive process that builds configurational representations from a given input. Secondly, lexical entries can directly encode the (truth-theoretically) underdetermined nature of linguistic content, for example anaphoric dependencies (cf. Kempson 1992a,b), these providing the most striking evidence for the involvement of inferential processes in utterance interpretation. The enrichment of underdetermined input necessarily forces some implementation of choosing one representation rather than another in line with the Principle of Relevance.

The model I shall lay out in this chapter directly incorporates the representation of incremental processes in building logical constructs from underdetermined input. What follows is first an outline of such a logic, L(abelled) D(eductive) S(ystems) (Gabbay 1991), and the characterisation of a fragment of natural language within this model. We shall look at only a selection of syntactic phenomena with a view to highlighting the main claims of the theory. The following exegesis is based on Gabbay and Kempson (1992a,b), Kempson (1992a,b), de Queiroz and Gabbay (1992) and the reader is referred to these works for a fuller understanding of the issues.

3.2 Labelled Deductive Systems

3.2.1 Outline of the model

LDS is a logical proof discipline designed to manipulate objects called labelled formulae. The atoms of this logic are declarative units comprising a label and a formula as sketched out below:

$$(1) \quad \alpha : A$$

Here α is the label and A the formula. The step by step procedure of building up structure involves the manipulation of both labels and formulae, these providing the assumptions for the proof. The labels encode the history of the proof, and in that sense they are transparent, whereas the formulae denote the output of the procedure. This can be schematised as follows:

$$(2) \quad \begin{array}{l} 1. \quad \alpha : A \\ 2. \quad \underline{\beta : A \rightarrow B} \\ 3. \quad \beta(\alpha) : B \end{array}$$

The first line gives a well-formed formula containing the label α with the corresponding formula A . Similarly β is a label which has the formula $A \rightarrow B$, encoding Modus Ponens as part of its specification. The third line records the history of the combination in the label itself: β applied to α yields the formula B which is the output of the

combination. This step involves the logical rule of \rightarrow Elimination, which will be abbreviated in the proofs below as MP (Modus Ponendo Ponens).

Now let us look more closely at labelled formulae vis-a-vis their contribution to representing expressions of natural language. The formulae in this logic are the familiar truth values (t) and individuals (e), and any combination of these types by way of using the conditional sign (\rightarrow). Here we are diverging slightly from the standard type-theoretic notation we used in the previous chapter. In type theory an intransitive verb such as *walk* is represented as $\langle e, t \rangle$, which indicates that *walk* has a logical type such that when it is provided with an individual denoting item *e*, it will yield a truth value *t*. Here we shall adopt a more transparent notation in order to reflect the deductive and dynamic nature of this combination. We can easily rephrase the content of $\langle e, t \rangle$ as 'if given the type *e*, the output will be *t*'. This directly captures the content of \rightarrow Elimination. We shall henceforth represent one-place predicates as $e \rightarrow t$ instead of $\langle e, t \rangle$, and all higher types as instantiations of \rightarrow Elimination.

The labelled formulae in the proof are premises which are provided by lexical items. I shall indicate these simply as *Mary'* for the lexical item *Mary*, *wash'* for the lexical item *wash*, and so on.¹ These labels can be single lexical items or more complex entities which encode the history of combination as (2) (line 3) illustrates. For example, a label can display whether *Mary'* has combined with *wash'* as its internal argument or as its external argument, as will be illustrated shortly. In other words, labels not only indicate what has combined but also how the combination has taken place.

Declarative units only form part of a proof. Lexical items may also encode instructions as to how a proof is to proceed. Instructions on identifying anaphoric elements, and as I shall later argue, passivisation and overt structural case markers are such elements which, instead of contributing to a proof in terms of their content, function as specifications that control the development of a proof, hence they are said

to have procedural content which provides control specifications.

In line with the Principle of Relevance (which subsumes The Principle of Full Interpretation)² all linguistic elements in a string have to be interpreted. In our terms this means that all lexical items contribute in one way or another to a proof; if lexical items remain uninterpreted the proof will not be well-formed. A few points need to be mentioned briefly at this stage in connection with the employment of assumptions. One of these is that a premise can only be used once in a proof. Then, as in predicate logic, additional assumptions can be brought in as long as they are discharged in the end. And finally a proof does not necessarily proceed in a fashion reflecting the linear sequence of the incoming information. An element which does not contain the information which would allow it to be used immediately can "wait" until it can be provided with a suitable slot at which it can combine, unless other factors prevent it.

The information provided by all lexical items in a string, the labelled formulae and the control specifications, form a database. Since every object in this proof discipline is labelled, the database itself is also labelled. We indicate this as a "metabox" with the label s_a . The label of the metabox can, in principle, be whatever one chooses it to be, but databases of natural language constructs are labelled by the temporal specification provided by tense or aspectual elements, fixing the information of the database in a flow of time. As we mentioned, the proof discipline is a procedural enterprise, where there is no preset infrastructure into which atoms are slotted. The structure comes from the specifications in the formulae. A point which is related to this is that the proof will aim at proceeding and if there is no suitable contender for the proof to use, information can be brought in by means of abduction. In the case of a premise not being available, the process of abduction provides the means for finding where the information is. It thus provides a basis on which incrementation can take place when information is not available in the previous labels (cf. de Queiroz and Gabbay 1992). Finally, the whole procedure is goal directed, where the goal is to

achieve a well-formed formula, $\alpha:t$.

We can now look at the implementation of LDS in natural language by taking a simple clause like *Mary washed John*. The database is the collection of all labels (with their corresponding formulae) provided by the lexical items in the string: *Mary*, *wash*, *-ed*, *John* which provide the labels *Mary'*, *wash' -ed'* and *John'*. The formulae indicate the type of each element, so that *Mary'* labels an individual of type *e*, *wash'* being a two-place predicate labels a formula of type $e \rightarrow (e \rightarrow t)$, and so on. The label of the database is the temporal specification the string denotes. Tense does not appear as a labelled formula in the proof procedure, but an element that refers to the box label itself. All this information is illustrated in the proof below:

(3)

		s_a	GOAL $w'_1:x, w'_2:y..w'_n:z \vdash f(w'_1...w'_n):t$
Mary	1.	$Mary': e$	ASSUMPTION (USE LAST)
wash	2.	$wash': e \rightarrow (e \rightarrow t)$	ASSUMPTION
-ed	3.	CHOOSE $s_a = s_j, s_j < s_{utt}$	
John	4.	$John': e$	ASSUMPTION
	5.	$wash' (John') : e \rightarrow t$	MP 2,4
	6.	$wash' (John') (Mary') : t$	MP 1,5
		$s_j < s_{utt}, wash' (John')(Mary') : t$	

The goal of the proof is to derive a well-formed formula from the functional application of the labels of all the lexical entries in the database. Starting from *Mary* first, this has the label *Mary'* and the formula *e* which denotes an individual. This label comes with the additional specification that it is to be used last within a chain of arguments. The USE LAST command comes with the verb in English marking its left-adjacent argument as the subject, an issue which will be expanded below. Line 2 states the labelled formula of the lexical item *wash* which is a two-place predicate. Next in line 3 we have the past

tense morpheme. This does not have a type specification, but encodes the information that the database itself is to be identified with the temporal specification that it occurred in a time preceding the time of utterance. In line 4 *John* provides the labelled formula that will act as the input to the formula in line 2: the two-place predicate is provided with the first of the arguments it requires. This gives the one place predicate in line 5 by applying \rightarrow Elimination to lines 2 and 4. It is here, and later in line 6 that we see the history of combination in the labels, first as *John'* applying to *wash'*, then in line 6, again through the application of \rightarrow Elimination to lines 1 and 5. The outcome is *t* in line 6, an indication that the proof has concluded.

Given only the logical type assignments, any transitive verb and two arguments (subject and object) could combine in two ways, yielding the two interpretations *wash'(John')(Mary')* or *wash'(Mary')(John')* for *Mary washed John*. Clearly, the latter has to be excluded. This is standardly done by invoking an externally defined syntactic notion of subject as external argument. But in the development within the logic of Labelled Deductive Systems, control of inference is defined directly in the labelling algebra (Gabbay 1991, de Queiroz and Gabbay 1992). This gives us a new way of defining subject within the inference system itself. The concept of subject is defined directly as the selected minor premise $\alpha:e$ out of a set of premises $\alpha_n:e$ to some n -place predicate $\beta:e_n \rightarrow t$ which applies last in the sequence of steps of Modus Ponens to yield $\delta:t$, δ a label made up of $\beta(\alpha_1 \dots \alpha_n)$. One such premise in a derivation is then annotated to fix its application last in a sequence. How such a premise is identified varies from language to language. In English it is identified through order of the constituents relative to the verb, the subject immediately preceding the verb. Sequence of constituents is identified here as order of premises in the database. Accordingly, the verb is lexically specified as assigning the annotation USE LAST to the premise of type e most immediately preceding it in the database. In Turkish where order in the database is not used to identify argument structure, this annotation becomes a lexical definition of nominative case. In a similar manner, we might then annotate the object to be used first.

This is not necessary in the simple cases here. We return to this later.

The command CHOOSE in line 3 associated with the past tense morpheme as fixing the time such that it is prior to the time of utterance may appear, at first sight, too straightforward to be stated as a choice in such a simple clause. However in view of observations made by Enç (1986), tense is interpreted as an anaphoric element taking its full reference from the context in which it appears. For example the boldfaced past tense morpheme in *John walked out of the exhibition; he **hated** modern sculpture* refers to a time preceding the time the first sentence is fixed in, whereas the same tense morpheme in *John walked out of the exhibition; he **fainted*** refers to a time following it. For such reasons, it is necessary to represent tense as an on-line choice requiring the interpretation of other elements in the database (cf. Capritsa, Göksel and Kempson 1991, Kempson 1992b). Having given this preliminary exposition, I turn now to the representation of more complex constructions.³

3.22 The analysis of a fragment of English

3.221 Dependencies

The labels provided by the linguistic expressions *Mary*, *wash* and *John* in the sentence *Mary washed John* contain all the necessary information for building a structured configuration. Certain expressions in natural language do not provide full truth theoretic content and depend on other expressions for interpretation, given that underdeterminacy is part of the content of natural language. Phenomena as diverse as tense construal, indefiniteness, VP anaphora, adjectival and adverbial modification are all in general sensitive to the concept of context. Here we shall look at the prime example of such dependent elements, pronominal and reflexive anaphors.

To illustrate how such dependencies are represented in LDS, let us add the sentence *He fainted* to *Mary washed John*. Here, the pronoun *he* is underspecified with respect to its content. Although it provides some information, namely that the referent

is male and its structural position in a configuration is that of the subject, it is nevertheless underspecified as to how it chooses its referent. In other words, a premise introduced by a pronoun does not provide a full-blown label, but rather instructions as to how that label is to be used. This aspect of pronominals, indeed anaphors in general, is represented in terms of a metavariable, a variable ranging over variables instantiated in a specified way. Let us call the metavariable introduced by *he* u . This label has as its formula the logical type e , by virtue of *he* being a name like entity. We then have the following labelled formula for *he*:

$$(4) \quad u : e$$

But the specification lacks the restrictions imposed on *he*, with respect to its gender, configurational status and the locality restrictions imposed on it. In principle, the gender specification of *he* should allow its construal as any male. In actual fact, the referent of *he* in this context can only be *John* (assuming that these two sentences comprise the whole context). This provides us with the clues for the additional specifications regarding the lexical entry of *he*: that it cannot choose its referent locally, in our terms, it has to choose its referent from a different database. We can easily show this to be the case in the face of constructions such as *He loves John* where *he* and *John* are disjoint of reference. For present purposes we shall define locality in terms of database boundaries, and take two elements to be local to one another if they are in the same database. It should be remembered that we defined a database as being coextensive with the logical type of a well-formed formula t . We shall therefore assume that the t signals the end of the local domain. We can now add the following specifications to the lexical entry of *he*:

$$(5) \quad u_{\text{pron}} : e \quad \{ \text{male } (\Theta u_{\text{pron}}), \Theta u_{\text{pron}} \notin s_i, s_i = \text{local proof structure} \} \\ \text{(USE LAST)}$$

where Θ is a function stating how the variable is to be instantiated. The identification

of both pronouns and reflexives are subject to on-line decision making, as the proof below illustrates:

(6)

		S_a	GOAL $w'_1:x, w'_2:y..w'_n:z \vdash f(w'_1...w'_n):t$
Mary	1.	Mary': e	ASSUMPTION (USE LAST)
wash	2.	wash': $e \rightarrow (e \rightarrow t)$	ASSUMPTION
-ed	3.	CHOOSE $s_a = s_j, s_j < s_{utt}$	
John	4.	John': e	ASSUMPTION
	5.	wash' (John') : $e \rightarrow t$	MP 2,4
	6.	wash' (John') (Mary') : t	MP 1,5
		$s_j < s_{utt}, \text{wash' (John')(Mary')} : t$	

		S_b	GOAL $w'_1:x, w'_2:y..w'_n:z \vdash f(w'_1...w'_n):t$
he	1.	$u_{\text{pron}} : e$	$\{\text{male}(\Theta_{u_{\text{pron}}}), \Theta_{u_{\text{pron}}} \notin S_i, S_i = \text{local proof structure}\}$ ASSUMPTION (USE LAST)
		CHOOSE $u = \text{John'}$	
faint	2.	faint': $e \rightarrow t$	ASSUMPTION
	3.	faint'(John'): t	MP 1,2
-ed	4.	CHOOSE $s_b = s_k, s_k < s_{utt}$	
		$s_k < s_{utt}, \text{faint'(John')} : t$	

The first line is the premise provided by the lexical item *he* with its side conditions where the gender, locality restriction on the construal of the pronominal and its subjecthood are stated. The choice of the metavariable as John' follows from these restrictions and relevance theoretic constraints mentioned above. In line two the verb is introduced, combining in line 3 with its internal argument. Line 4 gives the tense which labels the database. Here we are putting aside the construal of the second past tense morpheme relative to s_j .

The lexical specification of a reflexive is similar to that of the pronominal except for the conditions on locality. A reflexive anaphor such as *himself* is:

$$(7) \quad u_{\text{ref}} : e \quad \{ \text{male} (\Theta u_{\text{ref}}), \epsilon s_i, s_i = \text{local proof structure} \}$$

Given this specification of the reflexive a sentence such as *John washed himself* would be represented as follows:

(8)

s_a GOAL $w'_1 : x, w'_2 : y..w'_n : z \vdash f(w'_1...w'_n) : t$	
John	1. John' : e ASSUMPTION (USE LAST)
wash	2. wash' : $e \rightarrow (e \rightarrow t)$ ASSUMPTION
-ed	3. CHOOSE $s_a = s_j, s_j < s_{\text{utt}}$
himself	4. $u_{\text{ref}} : e$ $\{ \text{male} (\Theta u_{\text{ref}}), \epsilon s_i, s_i = \text{local proof structure} \}$ ASSUMPTION
	CHOOSE $u = \text{John}'$
	5. wash' (John') : $e \rightarrow t$ MP 2,4
	6. wash' (John') (John') : t MP 1,5
	$s_j < s_{\text{utt}}, \text{wash' (John')(John')} : t$

The premise in line 4 introduced by the reflexive anaphor specifies its locality restrictions as choosing its referent in the local database. It is therefore construed as John. The proof then proceeds in familiar fashion.⁴

In this way, the construal of anaphoric expressions as stated over syntactic structures is replaced by the notion of structure encoded as part of lexical information. Pronouns and reflexives are taken to be elements which intrinsically introduce their locality restrictions, rather than being subject to a separate set of well-formedness conditions such as the Binding Principles.

3.222 Embedding

The databases so far constructed are only simple clauses. In order to be useable as a model of natural language analysis, the model must give an account of embedding. The construction of databases allows several ways of amalgamating information projected from one clause with another. Databases can be concatenated by being put in simple sequence, but be quite separate. One may, however, be contained inside another. And they may be linked through the use of variables in the labels. For completeness, I introduce linked databases and nested databases, but our principal concern later will be whether causatives require the latter structure.

3.2221 Linked databases

Linking is possible when two databases share the same variable. A formal definition of linking is given below (from Gabbay and Kempson 1992b):

- (9) Let $\Delta 1 = (s, f)$ and $\Delta 2 = (t, g)$ s and t labels, f and g functions, be databases with label $\alpha(x)$ and $\beta(y)$ appearing in them respectively, where x and y are variables. Then the pair $(r \text{ LINK } (\Delta 1, \Delta 2, \alpha, \beta, z))$ is a declarative unit with label r and the body (formula) is in the form of the pair $(\Delta 1(\alpha/z), \Delta 2(\beta/z))$ where z is the most general unifier of $\alpha(x)$ and $\beta(y)$.

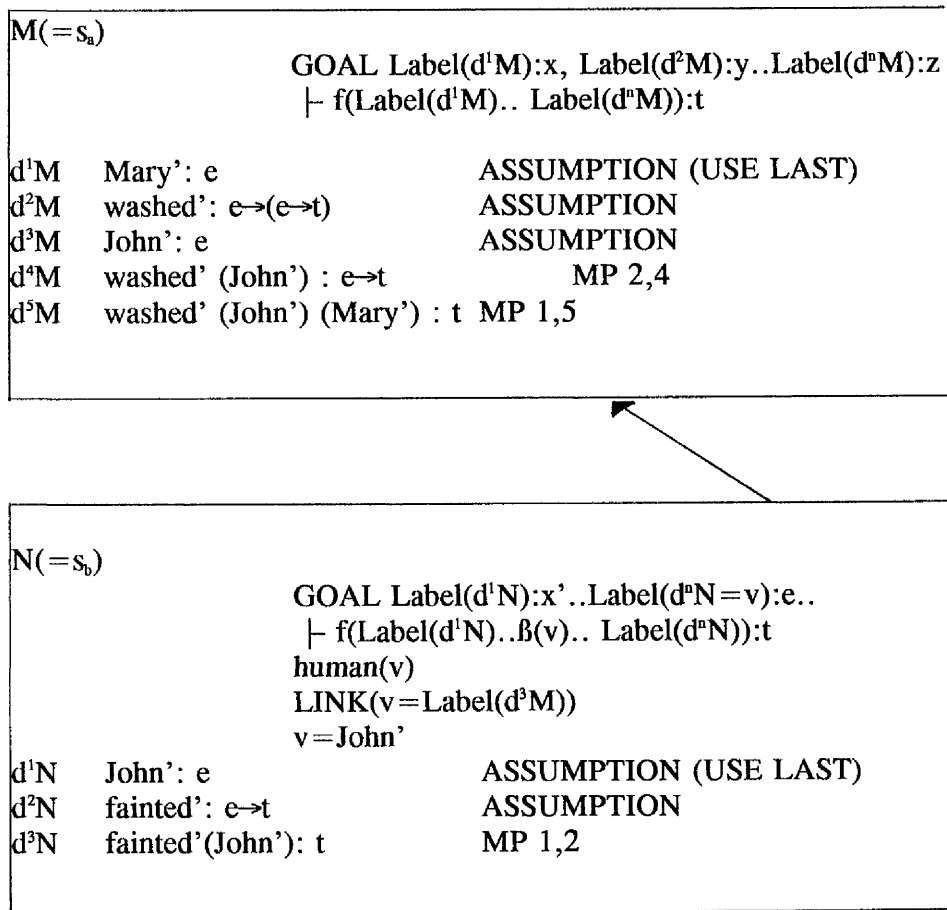
We say t appears in the new database if either t appears in r , or $t = r$, or $t \neq \alpha$ and $t \neq \beta$ and t appears in $\Delta 1$ or in $\Delta 2$.

A linking device is best exemplified by a relativiser such as *who*. Consider the clause *Mary washed John who fainted*. The WH-expression, in effect, has the function of linking the clause *Mary washed John* and *John fainted*. Looking at the relative clause above, we can therefore assume that the lexical specification of *who* encodes the creation of a database which is an open formula containing a variable, and which is linked to the initial database (*Mary washed John*) through the presence of a name. In other words, relativisers introduce linked structures at the point at which they occur in

the natural language string, containing a variable as part of their goal specification.

We can now illustrate the representation of *Mary washed John who fainted*. In order to have a means of keeping track of information across a tree we shall need ways of describing the nodes of proof structure as a tree. At this stage we shall therefore alter the notation and refer to steps 1, 2, etc. in the proof as d^1M , d^2M , etc., where d stands for data, the numerals stand for the order in which they are introduced and M stands for the database they occur in.⁵ Here we shall leave aside the representation of tense for reasons of simplicity and we shall assume that M , N , etc. can stand for database labels s_a , s_b , etc.

(10)



The goal specification associated with the WH-word encodes the information that a database has to be built in which an assumption $v:e$ is to be created at some point in the proof. That point is not specified in the goal specification. However, given that the structure is a relative clause, the WH-word does indicate that this assumed premise of the form $v:e$ is to be linked to the first database by substitution of John for v . Details of this can be found in Gabbay and Kempson (1992b). The point at which the assumption is constructed is determined by other premises projected from the lexical items in sequence. In general, premises projected by lexical items are fully identified by a label and a formula. Even underdetermined expressions such as reflexives and pronouns, which project incomplete labels, have their labels identified by an instantiation function which chooses a value. In order to be able to construct a premise by assumption, there must be one point in the proof where the lexical requirement of some premise are unsatisfied. It is at this point that the requisite argument is constructed. In the proof here it is the argument associated with *faint* which is missing from the sequence of premises projected by the lexical items. Hence it is at this point that the assumption $\text{John}:e$ is constructed.

3.2222 Nested databases

Subordination receives a straightforward representation within LDS. Like the Licensing Grammar model, the projection of logical structure is driven by lexical specifications. Embedding is then characterised by the embedding of a database as a label. For *Bill thought Sue washed John* we assign *think* the type $e \rightarrow (e \rightarrow t)$, allow entities of type e to range over databases, and databases to occur as labels. The only additional factor that needs mention is the treatment of the complement clause as an individual e . This guarantees that certain two-place predicates such as *think* and *know* allow the instantiation of a clause as their internal argument. We illustrate this below.⁶

(11)

M(=s _a)																													
	GOAL	Label(d ¹ M):x, Label(d ² M):y..Label(d ⁿ M):z																											
	⊢	f(Label(d ¹ M).. Label(d ⁿ M)):t																											
	(Θs _a < s _{utt})																												
d ¹ M	Bill' : e	ASSUMPTION (USE LAST)																											
d ² M	thought' : e→(e→t)	ASSUMPTION																											
d ³ M	s _b : e	ASSUMPTION																											
<table border="1"> <tr> <td colspan="3">N(=s_b)</td></tr> <tr> <td></td><td>GOAL</td><td>Label(d¹N):x, Label(d²N):y..Label(dⁿN):z</td></tr> <tr> <td></td><td>⊢</td><td>f(Label(d¹N).. Label(dⁿN)):t</td></tr> <tr> <td></td><td>(Θs_b < s_{utt})</td><td></td></tr> <tr> <td>d¹N</td><td>Sue' : e</td><td>ASSUMPTION (USE LAST)</td></tr> <tr> <td>d²N</td><td>washed' : e→(e→t)</td><td>ASSUMPTION</td></tr> <tr> <td>d³N</td><td>John' : e</td><td>ASSUMPTION</td></tr> <tr> <td>d⁴N</td><td>washed'(John') : e→t</td><td>MP 2,3</td></tr> <tr> <td>d⁵N</td><td>washed'(John')(Sue') : t</td><td>MP 1,4</td></tr> </table>			N(=s _b)				GOAL	Label(d ¹ N):x, Label(d ² N):y..Label(d ⁿ N):z		⊢	f(Label(d ¹ N).. Label(d ⁿ N)):t		(Θs _b < s _{utt})		d ¹ N	Sue' : e	ASSUMPTION (USE LAST)	d ² N	washed' : e→(e→t)	ASSUMPTION	d ³ N	John' : e	ASSUMPTION	d ⁴ N	washed'(John') : e→t	MP 2,3	d ⁵ N	washed'(John')(Sue') : t	MP 1,4
N(=s _b)																													
	GOAL	Label(d ¹ N):x, Label(d ² N):y..Label(d ⁿ N):z																											
	⊢	f(Label(d ¹ N).. Label(d ⁿ N)):t																											
	(Θs _b < s _{utt})																												
d ¹ N	Sue' : e	ASSUMPTION (USE LAST)																											
d ² N	washed' : e→(e→t)	ASSUMPTION																											
d ³ N	John' : e	ASSUMPTION																											
d ⁴ N	washed'(John') : e→t	MP 2,3																											
d ⁵ N	washed'(John')(Sue') : t	MP 1,4																											
d ⁴ M	thinks' (wash'(John')(Sue')) : e→t																												
d ⁵ M	thinks' (wash'(John')(Sue'))(Bill') : t																												

In the metabox labelled M the internal argument slot of the verb *think* is represented as an embedded database with a subgoal t. Hence s_b:e appearing as the third piece of data, this being induced by the lexical specification of *think*, a verb that takes a sentential complement. The subgoal specified in the subbox is satisfied in usual fashion. Once this subgoal is fulfilled, the proof goes on to be completed first by using the complement, and then by using the last premise (the first one to be introduced linearly).

Unlike linking which induces the creation of a separate database external to the initial database, subordination induces nested databases. These two have different implications. As we shall see below, a nested database inherits goal specifications from the main clause whereas linked databases are opaque to such inheritance in virtue of the presence of a new goal specification.

3.223 Non-local reasoning

Having introduced both linking and nested databases, we can now turn to non-local reasoning and how information gets carried down a proof. Consider a sentence like *Mary washed John who Bill thought Sue had washed*. The representation of this sentence involves no new mechanisms.

(12)

$M(=s_a)$		
GOAL $\text{Label}(d^1M):x, \text{Label}(d^2M):y \dots \text{Label}(d^nM):z$		
$\vdash f(\text{Label}(d^1M) \dots \text{Label}(d^nM)):t$		
d^1M	$\text{Mary}' : e$	ASSUMPTION (USE LAST)
d^2M	$\text{washed}' : e \rightarrow (e \rightarrow t)$	ASSUMPTION
d^3M	$\text{John}' : e$	ASSUMPTION
d^4M	$\text{washed}'(\text{John}') : e \rightarrow t$	MP 2,4
d^5M	$\text{washed}'(\text{John}')(\text{Mary}') : t$	MP 1,5

$N(=s_b)$																													
GOAL $\text{Label}(d^1N):x' \dots \text{Label}(d^nN=v):e \dots$																													
$\vdash f(\text{Label}(d^1N) \dots \beta(v) \dots \text{Label}(d^nN)):t$																													
$\text{human}(v)$																													
$\text{LINK}(v = \text{Label}(d^3M))$																													
$v = \text{John}'$																													
d^1N	$\text{Bill}' : e$	ASSUMPTION (USE LAST)																											
d^2N	$\text{thought}' : e \rightarrow (e \rightarrow t)$	ASSUMPTION																											
d^3N	$s_e : e$																												
<table border="1"> <tr> <td colspan="3">$P(=s_c)$</td></tr> <tr> <td colspan="3">GOAL $\beta(v) : t$</td></tr> <tr> <td colspan="3">$\text{LINK}(v = \text{Label}(d^3M))$</td></tr> <tr> <td colspan="3">$v = \text{John}'$</td></tr> <tr> <td>d^1P</td><td>$\text{Sue}' : e$</td><td>ASSUMPTION (USE LAST)</td></tr> <tr> <td>d^2P</td><td>$\text{washed}' : e \rightarrow (e \rightarrow t)$</td><td>ASSUMPTION</td></tr> <tr> <td>d^3P</td><td>$\text{John}'/v : e$</td><td>ASSUMPTION</td></tr> <tr> <td>d^4P</td><td>$\text{wash}'(\text{John}'/v) : e \rightarrow t$</td><td>MP 2,3</td></tr> <tr> <td>d^5P</td><td>$\text{washed}'(\text{John}'/v)(\text{Sue}') : t$</td><td>MP 1,4</td></tr> </table>			$P(=s_c)$			GOAL $\beta(v) : t$			$\text{LINK}(v = \text{Label}(d^3M))$			$v = \text{John}'$			d^1P	$\text{Sue}' : e$	ASSUMPTION (USE LAST)	d^2P	$\text{washed}' : e \rightarrow (e \rightarrow t)$	ASSUMPTION	d^3P	$\text{John}'/v : e$	ASSUMPTION	d^4P	$\text{wash}'(\text{John}'/v) : e \rightarrow t$	MP 2,3	d^5P	$\text{washed}'(\text{John}'/v)(\text{Sue}') : t$	MP 1,4
$P(=s_c)$																													
GOAL $\beta(v) : t$																													
$\text{LINK}(v = \text{Label}(d^3M))$																													
$v = \text{John}'$																													
d^1P	$\text{Sue}' : e$	ASSUMPTION (USE LAST)																											
d^2P	$\text{washed}' : e \rightarrow (e \rightarrow t)$	ASSUMPTION																											
d^3P	$\text{John}'/v : e$	ASSUMPTION																											
d^4P	$\text{wash}'(\text{John}'/v) : e \rightarrow t$	MP 2,3																											
d^5P	$\text{washed}'(\text{John}'/v)(\text{Sue}') : t$	MP 1,4																											
d^5N	$\text{thinks}(\text{wash}'(\text{John}'/v)(\text{Sue}')) : e \rightarrow t$																												
d^6N	$\text{thinks}(\text{wash}'(\text{John}'/v)(\text{Sue}'))(\text{Bill}') : t$																												

Notice that the goal specification of the relativiser *who* gets carried down to the subproof where it gets fulfilled in the embedded metabox. In other words, the embedded clause inherits the goal specification of the relativiser and the variable in the goal specification gets identified. This is a consequence of the deductive proof discipline and needs no special statement (cf. Kempson 1992a,b).

3.23 Arguments and adjuncts

Finally we consider the distinction between arguments and adjuncts. Our referral to the notions of argument and adjunct has so far assumed an implicit discrepancy between them. Here I would briefly like to mention what this discrepancy is based on.

Earlier analyses of arguments and adjuncts distinguish sharply between the syntactic properties of the two. This is illustrated by the fact that the X' schema inherently has specific positions for arguments (SPEC of IP for the subject and complement position for the direct object, cf. Stowell 1981, among others), as opposed to adjoined structures for adjuncts, positions which are not part of the main X' geometry. However, some later proposals blur the break off point between arguments and adjuncts by assigning subjects (which are arguments) to adjunct positions (cf. Hellan 1988 and references therein). Here we assume that earlier approaches are advantageous for a number of reasons.⁷ Firstly they capture the semantic motivation behind the distinction. The main distinction between an argument and an adjunct is that the former can be defined in terms of the saturation of a predicate, whereas the latter is peripheral to the lexical representation of a predicate. The role of an argument in the saturation of a predicate is usually taken as the basis of its definition in formal semantics. Works dealing with syntax and the lexicon generally refrain from providing a definition. To give a few examples, Hellan, Johnsen and Pitz (1989) state that "an argument of a word *w* is any constituent whose occurrence is somehow regulated by the presence of *w*". Grimshaw (1990) states that arguments are entities carrying grammatical information, the presence of which derives from the lexical conceptual structure of a predicate. Such

definitions indicate that the only coherent definition of an argument is one which is semantically based. The logical combination of an argument with a function yields a different logical type, one which is one step more saturated than the input type. In contrast, an adjunct does not cause a type change; when it combines, it generates the identical type of its input however this may be represented. An argument is therefore an inalienable part of the configurational definition of a predicate, which the type specification transparently displays. (Notice that this is distinct from the obligatoriness of the overt expression of an argument, which varies cross-linguistically). An adjunct is a syntactic notion whose presence does not rely on the predicate.⁸

3.24 Implications of modelling natural language as a procedural mechanism

The model we have sketched above is aimed at providing the formalism which enables natural language to be represented as deductive reasoning. In summary, I would like to emphasize certain aspects of this model with a view to presenting a clearer understanding of its contribution to modelling utterance interpretation.

First a note about the richness of lexical representations. The inventory of lexical specifications in LDS is considerably greater than other standard models. Lexical items can have the following types of properties:

1. declarative content: major premises such as predicates and minor premises such as names have this kind of information. They are represented as having logical type specifications only (such as $e \rightarrow t$ for *go*, $e \rightarrow (e \rightarrow t)$ for *drink*, e for *Jane* and so on.)
2. procedural content: some lexical items contribute to a proof by specifying how a certain premise is to be used. Such control specifications include those which are associated with WH-words, which we saw above as a directive to form a linked database and how to restrict its goal specification.
3. declarative + procedural content: lexical items can contain both these specifications such as the case with reflexives and pronominals. For example a reflexive such as *herself* has not only a logical type (e) but also locality constraints on where it can pick

up its reference from. Lexical items may also have associated inference rules.

4. database labelling: certain lexical items provide instructions for labelling the database, such as tense which fixes the content of the database in a flow of time. This array of lexical properties, including the possibility of having variables in lexical specifications allows for a relatively simple and straightforward mechanism of representing natural language strings as a manifestation of on-line decision making. Of these types of lexical specification we shall mostly be referring to the first two in the following chapters.

One of the most significant aspects of LDS is its power to represent configurationality and linearity separately. We shall leave the discussion of the various senses configurationality has had in the literature to the final chapter. Suffice it to say at this point that there is increasing recognition of the need to isolate linearity from configurationality in the light of growing evidence from the so-called free-word order languages. It may only then be possible to have a proper understanding of the interaction of the two.

A very simple example of the disparity between linearity and configurationality (which by the latter I mean hierarchy) is the combination of the direct object with the verb before the subject, in so far as direct object and subject are well-defined notions with asymmetric properties. In this system, this is a purely logical mechanism: arguments by definition, combine in a certain order, and that which combines first is hierarchically in an asymmetric position with respect to another which combines later. In some languages, linear order gives an indication, sometimes the sole indication (as in English) as to which combines first. The notions of subject and object in English can, with a handful of exceptions, be read off the order in which they appear in the string. In other languages linear order gives no indication of this kind and there are other surface factors which play the part linear order plays in English, such as case markers and/or intonation. These languages may not use linear order for any purpose, or they may use it for purposes other than marking the order of combinatorial processes. For

example linear precedence may figure in dependency relations, just as combinatorial order does in fixed word order languages. Hence it is crucial to give separate characterisations to surface linearity and combinatorial order. LDS does exactly that. Notice that combinatorial order comes from the declarative information in the labelled formulae. In contrast, linear order is characterised quite separately, in terms of the pieces of information that enter the database in a stepwise fashion.⁹ I shall be relying heavily on the disjoint nature of these two separate mechanisms in the following chapters.

3.2 Conclusion

In the first two chapters of this work we analysed complex predicates within two different models: Government and Binding, and Licensing Grammar, and presented reasons for the need to formulate a different model. We have now seen the basic tenets of Labelled Deductive Systems and are ready to embark upon the analysis of complex predicates and argument structure starting with the causative construction in the next chapter.

NOTES

1. An alternative is to use a more explicit lexical description for verbs. In such a case *give* would have the label $\lambda x \lambda y [V(y)(x)]$. As we shall be requiring this type of representation for a causative complex predicate, we shall later resort to such a representation. For the purposes of the model, this is not a requirement and we shall resort to the more simplified version throughout this chapter.
2. The Principle of Relevance precludes the unnecessary usage of uninterpreted elements, as these create additional effort without any gain.
3. The reader is referred to Gabbay and Kempson (1992a) for an excellent exegesis of LDS and its application to linguistic expressions.
4. The possibility of defining locality in other ways remains open. In principle, an anaphoric expression can select as antecedent any previous premise in the database or the immediately previous antecedent in the database, both of these being linear restrictions. Alternatively the characterisation of anaphoric dependence can be run off the argument structure of predicates, an option developed to some extent for causativisation in Grimshaw (1990). Languages may vary with respect to the option they choose.
5. cf. Gabbay and Kempson (1992b) for the use of this terminology in defining a tree construction algorithm for linked databases.
6. This formulation would require a means of discriminating different kinds of individuals. Otherwise the system might wrongly predict sentences like *John hit that Mary is sick*. I leave this matter open. The alternative is to characterise embedding through assigning the type $t \rightarrow (e \rightarrow t)$ to *think*.
7. Pettiward (1993) points out that this leads to an internal inconsistency in the GB framework, but here we are interested in the characterisation of this difference in LDS.
8. Middle constructions in English might be taken as a counterexample to this generalisation. Although a number of sentences are provided in the literature, such as

This book reads easily, the data seem to indicate that middle constructions are not productive, with sentences such as *?*This milk drinks fast*, *?*The rice eats well*, *?*The movie watches/sees well* as possible counterexamples. The obligatoriness of the adjunct cannot be taken as an indication that it is part of the argument structure where the examples might indicate that these are lexicalised forms.

9. An alternative analysis is proposed by Hepple (1993). In his analysis, linear order is given in the labels themselves, rather than in the order in which the information appears in the database. This might be possible, even advantageous in fixed word order but in languages such as Turkish, it is not clear how this would work unless a multiplicity of lexical specifications were allowed for each possible order.

PART II

THE ANALYSIS OF COMPLEX PREDICATES

CHAPTER IV

COMPLEX PREDICATES AND ARGUMENT STRUCTURE 1: CAUSATIVES

4.1 Introduction

With the necessary background assumptions now in place, this chapter investigates the properties of morphological causatives and the representation of argument structure in these constructions in line with the model outlined in the previous chapter. Since it is at this point that we seek to give a full account of causativisation in Turkish, we return first to the data. The layout is as follows: in 4.1 a general presentation of morphological causative constructions will be given. In 4.2 I will develop an LDS account of these constructions and outline their principal properties. Section 4.3 focuses on the implications of the present mode of analysis on some other issues interacting with the representation of argument structure.

4.2 Causatives in Turkish

The emphasis in this section is on morphological causatives, although I shall also provide a summary of periphrastic and lexical causatives by way of background information.

4.21 Periphrastic causatives

The phrasal causative construction contains verbs such as *sagla* 'cause', *zorla* 'make, force' and *yol aç* 'enable', which differ both in terms of the type of complement they select and the case-marker on these complements:

- (1) a. Zeynep [Emine-nin oda-ya gir-me-si]-(n)i sagla-dı.
-GEN room-DAT enter-GER-POSS-ACC make/have-PAST
Zeynep had Emine enter the room.

- b. Zeynep [Emine-nin oda-ya gir-me-si]-(n)e yol aç-tı.
 -GEN room-DAT enter-GER-POSS-ACC cause-PAST
 Zeynep caused Emine to enter the room.

- c. Zeynep Emine-yi [oda-ya gir-me]-ye zorla-dı.
 -ACC room-DAT enter-GER-DAT force-PAST
 Zeynep forced Emine to enter the room.

Periphrastic causatives will only be referred to when required by the analysis of morphological causatives.

4.22 Lexical causatives

Lexical causatives are verbs which have the causative suffix merged with the root as in (2a-c) or are non-compositional as in (2d-e):

- (2) a. gör 'see' → göster (*gör-dür)
 b. gel 'come' → getir (*gel-dir)
 c. git 'go' → götür (*git-tir)
 d. gir 'enter' → sok (*gir-dir)
 e. kal 'remain' → bırak (*kal-dır)

Although there is an entailment relation between the causativised verbs in (2 a-c) and the root verbs they correspond to, there is no reason to assume that such a relation is to be characterised as part of their lexical specification, contra suggestions put forward by Lakoff (1976), McCawley (1968), and others. Otherwise lexical specifications would have to include all kinds of semantic relations which do not correspond to specific morpho-phonological units and which, moreover, do not play a part in configurational processes. Any entailment relation which exists between such pairs and those which are a result of the combination of the causative is at best a

conceptual one, in line with arguments put forward by Fodor (1970). There is no evidence that lexical causatives are anything other than transitive verbs which have the type specification $e \rightarrow (e \rightarrow t)$.

4.23 Morphological causatives

Morphological causativisation is a productive process involving both transitive and intransitive verbs:¹

- (3) Deniz Yusuf-u otur-t-tu.
 -ACC sit-CAUS-TNS

Deniz made Yusuf sit.

- (4) Deniz Yusuf-a ev-i yık-tır-dı.
 -DAT house-ACC demolish-CAUS-TNS

Deniz made Yusuf demolish the house.

The identification of the causative suffix presents some problems, and this is what we shall look at next.

4.231 Identifying the causative suffix

There is considerable confusion as to what counts as a causative suffix in Turkish. Sources refer to between one (Timurtaş 1964) and seven (Ergin 1962) variants.² The disagreement over the variants is partly related to the function of the causative as a transitiviser, but phonological factors, too, play a part in the discord. First I will briefly dwell upon the phonological properties of the relevant Turkish suffixes for clarification.

Turkish grammars agree that the suffixes *-t* and *-tir* in (3) and (4) are canonical examples of the causative morpheme.³ *-tir* is an allomorph of *-Dir*, where capital characters refer to susceptibility to changes occurring as a result of vowel and consonant

assimilation, processes mentioned in section 1.111. (I will follow the custom of using capital characters only for purposes of exposition in this section, but in later sections I shall represent the causative morpheme as *-tir*, for convenience.) D alternates between /t/ and /d/, and I alternates between /ɪ/, /i/, /u/, and /ü/, giving rise to the following allomorphs: *-dir*, *-dir*, *-dur*, *-dür*, *-tir*, *-tir*, *-tur*, *-tür*. Polysyllabic stems ending in /r/, /l/ or a vowel select *-t*, as in (3), otherwise an allomorph of *-Dir* is selected, as in (4).⁴ This much is uncontentious. What is arguable is the existence of two more affixes in the language, *-Ir* and *-Ar*, the description of which has evaded general consensus.⁵ It is generally accepted that these suffixes are added to a stem to make it transitive, as demonstrated below:

- 5) a. Bardak düş-tü.
 cup fall-PAST
 The cup fell.
- b. Bardag-ı düş-ür-dü-m.
 cup-ACC fall-TR-PAST-1
 I dropped the cup.
- (6) a. Ip kop-tu.
 string snap-PAST
 The string snapped.
- b. Ip-i kop-ar-dı-m.
 string-ACC snap-TR-PAST-1
 I snapped the string.

There are basically two questions related to the status of *-Ir* and *-Ar*. One of these concerns their status as allomorphs from a phonological point of view. The second

question is a syntactic consideration: can transitivisers and causatives be considered structurally identical? I will take each question in turn.

4.2311 Morpho-phonological properties

It was explained in section 1.111 that the presence of I or A in an affix distinctly marks its phonological status. Suffixes that have I in their phonological representation cannot surface as /a/ or /e/ in the process of vowel harmony, and suffixes which have A cannot surface as /ɪ/, /i/, /u/ or /ü/. Hence, the presence of I or A in the representation of a suffix reflects a morphemic distinction. To give an example, -sI (with its allomorphs -sɪ, -si, -su, -sü) is a nominal compound suffix, but -sA (with its allomorphs -se, -sa) is the conditional suffix. Minimal pairs of this type are plentiful. There is, however one exception to this generalisation. The aorist suffix (which, incidentally, is phonologically identical to the subgroup of causatives we are discussing) does not respect the I/A distinction as a criterion predicting morphemic differences. It does not have the usual number of allomorphs (either four (of the I group) or two (of the A group)) but instead, has six: -ar, -er, -ır, -ir, -ur, -ür. Therefore the selection of one or the other form is not simply an instantiation of vowel harmony, but also depends on the lexical idiosyncrasy of the verbal base. For example, the aorist which is attached to *gör* 'see' is -ür (of the I group) resulting in *görür*, but a phonologically similar verb *ör* 'knit' takes -er (of the A group). This fact is considered to be an idiosyncrasy of the aorist suffix, possibly explicable by other factors relating to the historical development of the language.

It has been claimed (Johanson 1979) that the same phenomenon is true of transitive -Ir and -Ar. Since the I/A distinction can be overridden as it has been in the case of the aorist, and considering there is no syntactic or semantic distinction that follows from selecting -Ir or -Ar, I will conclude that the two are allomorphs not only in the case of the aorist, but also in the case of causatives. This conclusion is supported by the fact that the description of the function of these two in historical sources is

identical and there is no verb that can combine with both (Banguoglu 1974, Ergin 1962, Timurtaş 1964). Phonological considerations, then, permit one to state the variants of the causative suffix as follows (allomorphs given in { }):

- (7) (i) -t: after polysyllabic stems ending in a vowel, /l/ or /r/.
- (ii) around thirty monosyllabic verbs idiosyncratically take one of the following suffixes:
- It {-it, -it, -ut, -üt}
 - Ir {-ır, -ir, -ur, -ür}
 - Ar {-er, -ar}⁶
- (iii) -DIr: elsewhere. {-tır, -tir, -tur, -tür, -dır, -dir, -dur, -dür}

Morpho-phonological properties are of secondary importance with respect to the issues discussed in here, and I refer the reader to sources cited in footnotes 1-6 for further clarification of these issues. More relevant are the syntactic criteria for identifying the causative suffix, to which I now turn.

4.2312 Distributional properties

The suffixes -Ir/-Ar have often been described as transitivisers rather than as a subgroup of the causative morpheme. This is probably a consequence of the fact that *-ir/-ar* only attaches to intransitive verbs, while the canonical causative *-tir/-t/-it* can attach both to transitives and intransitives.

Apart from crosslinguistic etymological considerations which can be taken as supportive evidence,⁷ it would be desirable to give a unitary account of causativity and transitivity, processes which are identical in terms of inducing an additional argument. In section 4.31 we shall provide the motivation for a unitary analysis. At this stage we are only interested in seeing whether there is any evidence against a unitary analysis.

The most obvious factor which calls for a unification is that verbs may either select *-ir/-ar* or *-tir/-t/-it*, indicating that there is no functional difference between causativity and transitivity, as illustrated in (8) and (9). If they were distinct, one would expect minimal pairs of V-transitive/V-causative sequences, which do not, in fact, exist.

- (8) Yusuf kedi-yi ağac-a çık-ar-dı.
 cat-ACC tree-DAT ascend-CAUS-PAST
 Yusuf made the cat climb the tree.

- (9) Yusuf kedi-yi ağaç-tan in-dir-di.
 cat-ACC tree-ABL descend-CAUS-PAST
 Yusuf made the cat descend from the tree.

I shall therefore conclude that in addition to the phonological considerations above, distributional factors too lead one to the conclusion that the causative suffix has the five variants in Turkish given in (7) and that there isn't a separate set of affixes whose sole function is to transitive.

4.2313 **Semantic properties**

The interpretation of the causative morpheme ranges from 'force' to 'allow' as well as the neutral 'cause' in Turkish. Similar ranges in meaning are attested in other languages (Hetzron 1976, Kachru 1976, among others). Bainbridge (1987) claims that when the causative affix is used in the permissive sense in Turkish, the clause cannot contain an agentive (dative marked) element. Considering that such a dative NP is the marker of the causee in sentences with a transitive root verb, there is no apparent reason why (10a) can have a permissive interpretation but (10b) cannot:

- (10) a. Işık-ı kapat-**tır**-dı-m.
 light-ACC turn off-CAUS-PAST-1
 I permitted (someone) to turn off the light.
- b. Işık-ı Ali-ye kapat-**tır**-dı-m.
 light-ACC -DAT turn off-CAUS-PAST-1
 I made/*permitted Ali to turn off the light.

Native speakers agree with Bainbridge's claim. Indeed, (10b) cannot be interpreted as 'I permitted Ali to turn off the light', but only as 'I made/forced Ali to turn off the light. If negated, though, (10b) can have a permissive reading. I shall leave such factors affecting the interpretation of the causative particle to further research.⁸

4.3 The representation of causativity

The causative suffix in Turkish can be attached to transitive and intransitive root verbs. When it attaches to transitive verbs, the causee appears with dative case marking as in (11b) and (12b), and the accusative marked direct object of the root verb remains as it is.

- (11) a. Deniz kapı-yı aç-tı.
 door-ACC open-PAST
 Deniz opened the door.
- b. Nuran Deniz-e kapı-yı aç-**tır**-dı.
 -DAT door-ACC open-CAUS-PAST
 Nuran made Deniz open the door.
- (12) a. Çocuk paket-i sar-dı.
 child pack-ACC wrap-PAST
 The child wrapped the pack.

- b. Nuran *çocuk-a* *paket-i* *sar-dır-dı.*
 child-DAT pack-ACC wrap-CAUS-PAST.

Nuran made the child wrap the pack.

When it attaches to intransitive verbs the causee has accusative marking.

- (13) a. Bardak *yer-e* *düş-tü.*
 glass ground-DAT fall-PAST
 The glass fell on the floor.

- b. Nuran *bardag-ı* *yer-e* *düş-ür-dü.*
 glass-ACC ground-DAT fall-CAUS-PAST
 Nuran made the glass fall on the ground. (dropped the glass)

- (14) a. Çocuk *çak-tı.*
 child fail-PAST
 The child failed.

- b. Öğretmen *çocuk-u* *çak-tır-dı.*
 teacher child-ACC fail-CAUS-PAST
 The teacher made the child fail.

As mentioned in section 1.112, word order in such sentences is free, and scrambling the constituents only gives rise to differences in interpretation relating to focus, background information and afterthought.

The causative suffix can also attach to a verb which has already been causativised, sometimes with the effect of full causativisation (cf. section 2.2364), but more often only for emphasis. The sequence of the variants can be predicted

straightforwardly from the phonological rules mentioned in section 4.2311 above, so that it is *(-..r)-t-tir-t*.

4.31 The logical type of the causative suffix

The representation of causativity involves, first and foremost, an elucidation of the notion of transitivity. Some works (cf. Sebüktekin 1971, Dede 1984, Özkaragöz 1986) draw on examples such as (15) to interpret transitivity as merely one of the functions of a causative morpheme, a position which could lead to a disjunction between causatives and transitivisers. On this view (15) would ambiguously be a transitive and a causative construction.

- (15) Bardag-ı düş-ür-dü-m.
 cup-ACC fall-CAUS-PAST-1
 (i) I dropped the cup.
 (ii) I made the cup fall.

In the discussion relating to the identification of the causative morpheme in Turkish in section 4.231 I claimed that there were no morpho-phonological or distributional factors indicating the presence of a transitivising suffix as distinct from a causative, suggesting that the term transitive was logically opaque. Furthermore in sections 2.221 and 2.222 I specifically argued that the terms transitive and intransitive were notions relevant to surface characterisations at best, and not to the logical/configurational properties of verbs. Many researchers (Hoekstra 1984, and references therein) share the view that there is no tangible difference between causativity and transitivity and that the former can be subsumed under the latter. There are several reasons why such a stance is preferable over one in which transitivisers and causatives have separate lexical specifications. One of these is that they have identical truth theoretic content. This property can best be explained in terms of the entailment relationship that holds between an underived predicate and a causative predicate: *V + tir*

$(x)(y)$ entails $V(x)$. If anything, (15) is an illustration of this entailment: whatever the interpretation, the fact that the cup fell holds. Whether it was an accident or was made to fall deliberately has nothing to do with its argument structure but is determined from the context. It is this unitary relation between an argument and a predicate (despite other differences in interpretation) that we want the logical specification of the causative morpheme to capture, since such specifications constitute the core of logical representations.

It is, of course, possible to express this relation exclusively as a semantic postulate. However, a closer look at the properties of causative constructions reveal that not only is it desirable to provide a unitary account, but that the overlap between the functions of a causative and a transitiviser, if any, actually ensues from the fact that it is logically inconceivable to articulate a characterisation for a transitiviser distinct from a causative. The only representation that a transitiviser can have is identical to that of the causative, and any other representation is logically ill-formed. Why this should be so is as follows. Causativity is a process which is concomitant with the addition of an argument to a sentence, a property which has to be encoded in the logical characterisation of the causative suffix. The addition of an argument can be represented in a number of ways. One can either claim that the causative suffix has the effect of turning a one-place predicate into a two-place predicate and a two-place predicate into a three-place predicate as in (16) (hence some kind of a transitiviser), or one could argue that it takes a functional complex and creates a one-place predicate as in (17):

- (16) a. $(e \rightarrow t) \rightarrow (e \rightarrow (e \rightarrow t))$
 b. $(e \rightarrow (e \rightarrow t)) \rightarrow (e \rightarrow (e \rightarrow (e \rightarrow t)))$

- (17) $t \rightarrow (e \rightarrow t)$

It is, of course, possible to characterise (16) in more general terms, namely as $(e^n \rightarrow t) \rightarrow (e^{n+1} \rightarrow t)$. But in this case one would have to stipulate that this cannot be

generalised across types. On the other hand, leaving it as it is raises a question: since one-place predicates and two-place predicates are of separate types, the causative suffix would have to be represented as a polymorphic type in the lexicon, one taking a one-place predicate as input, and the other taking a two-place predicate as input. Even if this were independently motivated in this framework, in this case it would require an additional specification regarding the precedence relations in the combinatorial process. Merely saying that a causative adds an additional argument does not, in and of itself, dictate which argument that should be. In contrast, in the second option which is (17), the nature of the root verb is irrelevant. The input type is the logical type of a proposition, a *t*, which can either contain a one-place predicate or a two-place predicate. Moreover, not only is the input type unified, but so is the output type which is a one-place predicate. However, (17) is superior to (16) for a more important reason. Although (16a) encodes the addition of an argument, it does not specify at which point that added argument is to be used in the combinatorial process. If such an argument could be free to combine at any stage, it could correctly create a construction which respects the entailment relation, that is, it could combine with $V(x)$ (such as *walk' (dog')*) to yield $V(x)(y)$ (such as *walk' (dog') (John')*). But it could also yield $V(y)(x)$ (which would be *walk' (John') (dog')*, which does not entail *walk' (dog')*). Hence the entailment relationship which defines causativity would be jeopardised. It is this kind of an overgeneration that forces one to give a unique characterisation to the causative.

One could also argue on slightly different grounds that the causative cannot merely be an argument adder. Consider scope factors similar to those suggested in Cooper (1976) where Japanese causative sentences with certain adverbials have three interpretations suggesting a biclausal analysis:

- (18) Taroo ga Hanako o keya ni sankai hair-ase-ta.
TOP ACC room-DAT three times enter-CAUS-PAST

(i) Taroo (once) made Hanako enter the room three times.

(ii) Taroo three times made Hanako enter the room.⁹

(From Shibatani 1973 cited in Cooper 1976)

If the causative suffix were merely an argument adder, an adverb which counts occurrences of events or actions such as 'three times' would have to be construed as referring to an argument rather than the event, a stance which is untenable.

It should be recalled that scope factors relating to the negative suffix (see section 1.215) provided similar results. There we saw that the negative suffix either had the causative in its scope, or only the root verb. If we were to take the causative as adding an argument we would again have to negate the argument, which is not the case in such constructions. I therefore claim that on the grounds discussed above, the causative has a logical representation that encodes its complement as a functional complex t yielding the logical type of a one-place predicate $\langle e, t \rangle$, hence the representation in (17), a $t \rightarrow (e \rightarrow t)$.

4.32 The representation of case marking

Throughout section 2.23 I pointed out the significance of the role of case marking in providing logical representations for complex predicates. Then in section 2.3 I showed that representing case as a logical type proved to be inadequate for a number of reasons. We shall now have to look at how case can be represented in the LDS format given the part it plays in interpreting the relation an argument has with the predicate.

Suppose we take case marking to give instructions as to how to combine premises in a proof structure. This would mean that each case marker had a unique specification directing its adjacent argument to a specific point in the combinatorial

process. This can be achieved straightforwardly by stating at which step an argument is to combine. Type specifications encode the number of arguments that have to combine. Case marking simply gives the order of combination with respect to the arguments involved. In other words, case is an instruction on how to identify an argument in a predicate-argument structure. We suggest that in LDS this is construed as the procedural incrementation of a proof structure by identifying how the arguments are to combine. Given this approach, one can then analyse case as an instruction on how to deduce a conclusion from a sequence of premises.

Let us assume that an accusative case marker identifies its adjacent argument as the argument to combine before all other arguments in a proof, this stated as a side condition. This specification proves to be empirically adequate and sufficiently explicit in a number of constructions with accusative marked arguments. The simplest case is a construction such as (19), a simple transitive construction which has an internal argument marked as accusative.

(19) John Mary-i gör-dü.
-ACC see-PAST.

John saw Mary.

(19')

		S_a	GOAL $w_1: x, w_2: y, \dots w_n: z \vdash f(w_1, \dots, w_n) : t$	
John	1.	John' : e	ASSUMPTION (USE LAST)	
Mary	2.	Mary' : e	ASSUMPTION	
-i	3.	$f_{acc}(Mary:e)$ = Mary : e	USE FIRST	
gör	4.	$\lambda x \lambda y [V(x)(y)] : e \rightarrow (e \rightarrow t)$	ASSUMPTION	
	5.	$\lambda y (gör'(Mary')(y)) : e \rightarrow t$	MP 4, 3	
	6.	$gör'(Mary')(John') : t$	MP 5, 1	
-dü	7.	CHOOSE $s_a = s_j, s_j < s_{utt}$ $s_j: gör'(Mary')(John') : t$ $s_j < s_{utt}$		

Note that the numbers reflect the successive steps of interpretation and not the successive steps of deduction. Recall that a proof discipline of this kind has n-tuples of labelled formulae which are taken to be premises in steps of Modus Ponens. The database is labelled with a temporal specification (s_a), the time being referred to by the utterance. The goal, as mentioned, is to deduce a well-formed formula t using all words and segments. So we start the proof by retrieving from the lexical entry for *John* the premise $\text{John}' : e$.¹⁰ In the second line we have the second premise, represented in a similar fashion. The third piece of information presented by the sequence of morphemes is the accusative case marker. This does not enter the proof as a logical type, but as a specification on how to build a proof. Its function is to identify its adjacent NP as the argument to combine initially with the major premise, the predicate, in a chain of arguments, a property which we shall shortly elaborate. We shall demonstrate below that this specification makes correct predictions for the array of instantiations of the accusative suffix. The major premise provided in line 4 is a two-place predicate. We immediately use the information we already have, in order to satisfy the requirements of this predicate. Applying Modus Ponens to lines 4 and 3, and, crucially, by means of using the instructions given by the case marker we come to line 5, where $\text{gör}(\text{Mary})$ is a one-place predicate. Next, in line 6, we combine the remaining argument to get to a t applying Modus Ponens to lines 5 and 1. In line 7 the instruction relating to the tense suffix enters the proof. The contribution of tense is given as a control specification, providing instructions as to how the temporal specification is to be assigned to the utterance. The past tense morpheme simply states that the label of the meta-box s_a , which is the time specification, is to be chosen as s_j , this being a time which precedes the time of the utterance. Hence $s_j > s_{\text{utt}}$. For a discussion of tense as a device labelling metaboxes, see Capritsa, Göksel and Kempson (1991).

I stated above that the function of case markers was to identify the combinatorial properties of arguments. I suggest that the way this is achieved is as follows. Assuming that words are identifiable phonologically, a word such as *Parisi* would be mapped on

a logical/conceptual representation which would separate the word into two morphemes, *Paris* and *-i*. The latter of these is identifiable as the accusative suffix which has the property of specifying the stage at which the argument it is attached to is to be combined in successive steps of function-argument application. For the accusative case marked argument this stage is the first in a series of minor premises, and as soon as the major premise is introduced. We formally state this as a function on a labelled formula $x:e$, identifying $x:e$ as $\langle x, \text{use first} \rangle :e$. Note that terms such as accusativity do not have formal status in a proof and the function associated with the accusative case marker is represented as f_{acc} instead of f_i (i for the accusative suffix *-i*) for convenience. In effect, case markers introduce control specifications without changing the declarative content, and the logical type of the premise remains an individual denoting entity. Similarly, the nominative case also describes the combinatorial aspect of the argument, this time specifying it as combining last in a chain of minor premises. However, unlike the accusative case marker, the nominative is not marked with an overt case marker. We therefore suggest that the function associated with the nominative is a function on $x:e$, identifying $x:e$ as $\langle x, \text{use last} \rangle :e$, represented as $f_n(x:e) = x:e \text{ USE LAST}$. We shall not be entering this function into a database and simply assume that a non-case marked argument comes with this specification.¹¹

The specifications associated with case markers show once again the array of lexical properties which can enter into building syntactic representations. We have already seen that lexical items such as names and predicates have declarative content and they provide the minor and major premises of the proof respectively. We have also mentioned temporal and aspectual markers as providing functions on a label and WH-words which give goal specifications. And finally, we have seen that case markers are functions on minor premises, specifying their combinatorial properties. The format of the lexicon is considerably rich: lexical items can have declarative content, procedural content or both. The logic then uses these specifications to reason and come to a conclusion.

A more complicated case than (19) is presented by (20) an E(xceptional) C(ase) M(arking) construction. In these constructions, the external argument of the lower clause is marked accusative. If the lower verb is transitive, then the internal argument of this verb also is accusative, yielding sentences where there are two accusative case marked arguments.

- (20) John Mary-i Bill-i gör-dü san-dı.
 -ACC -ACC saw-PAST think-PAST
 John thought Mary loved Bill.

In such cases, taking the accusative marker as an instruction guiding its adjacent NP to combine before all other arguments proves to be inadequate, simply because there are two instantiations of this property due to the fact that there are two accusative marked NPs. We thus have to make the assumption that the presence of two accusative NPs signal a break in the clausal structure, an indication that there is a sub-routine which has to be satisfied before the goal is achieved. We are then able to state the specification of the accusative marker informally as follows: combine adjacent argument before all other arguments in a local domain, where locality is defined as being within the remit of a subgoal. It should be noted that in such constructions the internal argument of the lower verb is always closer (in fact adjacent) to the verb of which it is an argument. Therefore defining locality in the way we have turns out to have a reflex in word order as well. Let us illustrate. In (20') the argument adjacent to the lower verb *gör* 'see' given in steps 4 and 5 respectively, is the initial argument to combine, being the most local argument. After step 7 where Modus Ponens is applied, there remains an additional slot in the argument structure. At that stage there are two remaining arguments, *John* and *Mary*, neither of which are in the same box. Of these two, the one which has the accusative has to combine next because the specification of the accusative dictates this. Therefore the premise in line 2 is reiterated to fulfil the goal of the subbox s_b , which is t.

(20')

		s_a	GOAL $w_1: x, w_2: y, \dots w_n: z$	$f(w_1, \dots, w_n) : t$	
John	1.	John' : e		ASSUMPTION, USE LAST	
Mary	2.	Mary' : e		ASSUMPTION	
-i	3.	$f_{acc}(Mary':e)$ = Mary' : e		USE FIRST	
		<div> s_b </div> <div> <p>Bill 4. Bill' : e GOAL : t</p> <p>-i 5. $f_{acc}(Bill':e)$ ASSUMPTION</p> <p> = Bill' : e USE FIRST</p> <p>gör 6. $\lambda x \lambda y [V(x)(y)] : e \rightarrow (e \rightarrow t)$ ASSUMPTION</p> <p> 7. $\lambda y (gör'(Bill')(y)) : e \rightarrow t$ MP 6, 5</p> <p> 8. $gör'(Bill')(Mary') : t$ MP 7, 2</p> <p>-dü 9. CHOOSE $s_b = s_j, s_j < s_{utt}$</p> <p> $s_j: gör'(Bill')(Mary') : t$</p> <p> $s_j < s_{utt}$</p> </div>			
san	10.	$\lambda \Phi \lambda z [V(\Phi)(z)] : t \rightarrow (e \rightarrow t)$		ASSUMPTION	
	11.	$\lambda z (san'(s_j: gör'(Bill')(Mary'), s_j < s_{utt})(z)) : e \rightarrow t$		MP 10,9	
	12.	$san'(s_j: gör'(Bill')(Mary'), s_j < s_{utt})(John') : t$		MP 11,1	
-di	14.	CHOOSE $s_a = s_i, s_i > s_j \ \& \ s_i < s_{utt}$			
		$s_i: san'(s_j: gör'(Bill')(Mary'), s_j < s_{utt})(John') : t$			
		$s_i > s_j \ \& \ s_i < s_{utt}$			

The claim that the accusative case marker forces its adjacent argument to be the initial argument to combine raises the following question: how come the arguments of single-argument clauses are not accusative but nominative? If the accusative case marked element is the first to combine, why isn't say, the subject of a simple intransitive marked with the accusative? Although some languages can have accusative marked subjects, as appears to be the case with certain Japanese passives (cf. Baker 1988, Miyagawa 1989), in Turkish this is never the case and no overlap is allowed for nominative and accusative case marking. If there is only one argument in a sentence it

has to be nominative: the subject of a passive and of an intransitive verb alike bears nominative case. In order to explain why the only argument in a constructions is marked nominative and not accusative, we require a statement to the effect that the nominative and the accusative are not only distinguished from one another with respect to specifying the order of combination, but also whether there are other arguments present in the database. Nominative case in Turkish is blind to the presence or absence of other arguments: it makes an argument combine last whether or not there are other arguments. Hence the specification of the nominative is *USE LAST* in an absolute sense. Thus the specification of the nominative stated this way subsumes the possibility of a nominative marked argument as being the only argument. The specification of the nominative argument as combining last is a reflection of the claims that the "external argument" is in a hierarchically asymmetrical position to the internal arguments, which have been argued for by Williams (1980), Manzini (1983), among many others). The specification of the accusative presupposes the presence of a chain of arguments in the database. In other words, an argument is marked accusative only if it is the first argument to enter the process of Modus Ponens and in an environment where there is more than one argument. To explicitly encode this restriction on the accusative (and on the dative as we shall shortly see) would require a statement to the effect that a premise marked accusative is a member of a set of premises annotated as minor premises to some major premise where that set contains more than one member. We define a minor premise as a premise of having the form $\alpha:x$ where x contains no connectives (hence is either of type e or type t as mentioned in 3.21), and a major premise as $\alpha:x^a \rightarrow t$.

As for the dative, we take it that this case marker has dual specification in terms of identifying its adjacent NP. When a dative case marker occurs with an NP, this NP can either be the causee, an argument whose existence depends on the presence of the causative, or an adverbial, in particular a goal/beneficiary, or an adverb of place. So in principle a causative construction with a dative marked NP can have two interpretations:

- (21) Küpeler-i Jane-e tak-tır-dı-m.
 earrings-ACC -DAT put on-CAUS-PAST-1
 (i) I made Jane put the earrings (on someone).
 (ii) I made someone put the earrings on Jane.

In (i) the dative marks an argument. Since we have identified the accusative as marking the initial argument in a chain of arguments, and the nominative as marking the last argument to combine, these positions will not be available for the dative marker to give procedural information. Suppose we assign the dative a specification such as 'identify adjacent NP as argument'. In a construction containing a chain of arguments the nominative and the accusative will specifically state the point at which they give instructions to combine; the dative marker will then direct its adjacent NP to the remaining position. Now suppose that we have a sequence where the dative marked NP appears initially. With an instruction such as the one we are assigning to the dative, this NP can potentially be assigned to any position. However when the other NPs appear with their nominative or accusative case markers giving specific combinatorial instructions, there will be a clash between these and the dative marked NP, hence the dative will again mark the 'remaining' argument by default. The position of the dative NP is therefore decided, according to this analysis, relative to the other case markers.

It could be argued that a more specific instruction is required for the dative, such as 'identify the adjacent argument as the second argument to combine'. Such a characterisation, together with the characterisation of the accusative case would also capture the insights first mentioned in Aissen (1974, later 1979), and also in Borer (1984). Aissen suggested that the accusative marked the lowest argument in a tree, and the dative the next one up, explicitly stating this in terms of the order of building up constituent structure in a bottom up fashion. Now there is a reason why one would want the dative to encode more information. If it did not contain more information, constructions which, due to the optionality of arguments, only have a dative marked NP

and no other arguments could not be interpreted. In any case, the dative must be construed as neither the subject nor the object (of a simple clause). We therefore have to specify as an encoded property of the dative that it can neither mark the initial nor the final argument in a chain of arguments. The specification we have given above is reformulated as follows:

dative: $f_{\text{dat}}(x:e) = \langle x, \text{use } \neg \text{ (first or last)} \rangle$

This way we shall be avoiding having to invoke some counting device whose status as a mechanism utilised by language is untenable, as well as avoiding the problem presented by constructions which only have a dative marked argument. One of the advantages of specifying case in this manner is that it accounts for scrambling phenomena without having to make recourse to any other conditions. Since a case-marker unambiguously directs its adjacent argument to a specific point in the combinatorial process, these arguments can be logically represented irrespective of the order that they come in.

As for the interpretation in (21ii) above, in these instances the NP which the dative marks is clearly an adverb and not an argument, and therefore a separate characterisation is required. One way of characterising an adverbial is to assign it a type-theoretic specification, such as indicating the mapping from an element of type e (the logical type of an NP) onto an $(e \rightarrow t) \rightarrow (e \rightarrow t)$, or possibly onto a $t \rightarrow t$. I will not commit myself to either of these options at this stage, but I merely wish to indicate that the second function of the dative is to create an adverbial, the explicit means of which I will leave for further research. For ease of exposition, I will assume that dative marked adverbs are of type $e \rightarrow ((e \rightarrow t) \rightarrow (e \rightarrow t))$.

What we have said so far has significant implications for the process of utterance interpretation. For one thing, cases seem to mark two quite distinct processes: on the

one hand they indicate the positions arguments hold in the combinatorial process, on the other hand they mark adjuncts. With respect to marking arguments one might very well ask the following question: if case markers build structure in the way described above, how can we recover missing elements? That is, how can we characterise a mapping between a string with missing arguments and its logical representation, if there is nothing to build structure with?

Arguments introduced by a major premise are obligatory elements in a database. They are obligatory because at the point where a predicate is introduced, the totality of the computational properties of this predicate is given by the arguments it has. Predicates are thus major initiating premises in a proof. In the proof discipline of LDS the proof procedure has recourse to elements which are not part of the present database. This allows the proof to recover content from the context; hence if an utterance has a missing argument despite the number of arguments required by the predicate, we can "fill in" the position of such an argument from the context, this making the recovery of unexpressed arguments formally possible. The fact that arguments do not have to be present in an utterance does not mean that they cannot be part of the database. They are retrieved either from previous utterances (in our terms from previous meta-boxes) or they are supplied with an arbitrary value when there is no indication of a specific value. Hence when I say *geldi* 'came' it is not the case that this sentence is logically ill-formed, but that it has a variable introduced by the type specification of the intransitive verb where this variable is present in the logical configuration and interpreted as someone or something capable of performing the action of coming. Supplying a value, albeit arbitrary, is therefore obligatory.¹² In effect, the null hypothesis would be that in cases where interpretation can run off arguments introduced in the discourse no overt arguments are required for logical well-formedness. The requirement of the overt expression of arguments in certain languages such as English could then be explained by parametric variations in surface sequences similar to ways in which word order is stated.

Adverbials, on the other hand, are not obligatory as arguments are, and they provide an extension of the database the effect of which is the introduction of additional information. Of course, it is not surprising that languages should have case markers with dual functions. Building structure by means of giving instructions on combinatorial processes and incrementing a database by extending it seems to be a property of other case markers as well. Several examples of case markers assuming functions other than marking arguments are cited in the literature. Nilsson (1985) and Enç (1991) argue that the accusative case marker in Turkish indicates specificity. In Belletti (1988) the partitive case in Finnish is taken to interact with definiteness. The partitive use of the ablative case in Turkish has been observed by Dede (1981) and Kornfilt (1990a) to encode the expression of quantification. Moreover it is natural to assume that a syntactic class (NP) should rely on a single paradigm (case marking) to encode different functions (that of marking arguments and that of marking adverbials).

Notice that the way we have articulated case exploits its universal function as describing the link between arguments and predicates. This does not mean to say that the properties of a specific case marker is universal, and in fact there is abundant evidence that this is not so. For example it is evident that the properties of the accusative case marker in Japanese are quite different from what we have specified as the accusative in Turkish, an observation made in section 2.2361. Muysken (1989) argues that accusative and genitive cases in Turkish and Quechua have different properties. Case marking in Germanic languages on the one hand, and ergative languages on the other present yet a different picture. Although our main aim is to study the case marking properties in Turkish, we shall nevertheless look at possibilities of explanation in these languages on section 4.43.

4.33 The representation of causative constructions in LDS

Having looked at the characterisation of the causative suffix and properties of case marking, we shall now turn to the representation of causative constructions in Turkish.

We start with a reminder of what the accusative and the dative cases mark in causative constructions in Turkish:

accusative: (i) external argument of intransitive root verb
(ii) internal argument of transitive root verb

dative: (i) external argument of transitive root verb
(ii) adverb (in transitive and intransitive constructions)

A causative construction containing a one-place predicate maps onto a logical configuration of the form illustrated below.

(22) Ayşe Ahmet-i düş-ür-dü.
-ACC fall-CAUS-PAST
Ayşe made Ahmet fall.

(22')

		s_a	GOAL $w_1: x, w_2: y, \dots w_n: z$	$f(w_1, \dots, w_n) : t$
Ayşe	1.	$Ayşe' : e$	ASSUMPTION, USE LAST	
Ahmet	2.	$Ahmet' : e$	ASSUMPTION	
-i	3.	$f_{acc}(Ahmet':e)$ $= Ahmet' : e$	USE FIRST	
düş	4.	$\lambda x [düş' (x)] : e \rightarrow t$	ASSUMPTION	
	5.	$düş' (Ahmet') : t$	MP 2,4	
-ür	6.	$\lambda \Phi \lambda z [\ddot{u}r' (\Phi)(z)] : t \rightarrow (e \rightarrow t)$	ASSUMPTION	
	7.	$\lambda z [\ddot{u}r' ((düş' (Ahmet'))(z))]: e \rightarrow t$	MP 5,6	
	8.	$((\ddot{u}r' (düş' (Ahmet'))) (Ayşe')):t$	MP 1,7	
-dü	9.	CHOOSE $s_a = s_j, s_j < s_{utt}$ $s_j: ((\ddot{u}r' (düş' (Ahmet'))) (Ayşe')): t$ $s_j < s_{utt}$		

Lines 1 and 2 provide the premises labelled by *Ayşe* and *Ahmet* respectively. The accusative marker in line 3 has side conditions specifying Ahmet' is to combine first. After the introduction of the predicate in line 4 Ahmet' fills in the first argument slot to yield a *t* in line 5. The causative suffix in line 6 is characterised as $t \rightarrow (e \rightarrow t)$ in line with its lexical specification, and it is labelled as $\lambda\Phi \lambda z [\text{ür}'(\Phi)(z)]$. In line 7 the first step in the properties of the causative suffix is fulfilled: by functional application, the *t* of line 5 is combined with $t \rightarrow (e \rightarrow t)$ in line 6 to form a one-place predicate. At this point we are only left with variable (*z*) for which we have to provide a value. But there is already a premise we have not used yet: the premise in line 1. By applying modus ponens again, this time to lines 1 and 7, we get to a well-formed formula in line 8. The temporal specification is construed as explained above in (19').

Notice that the proof above treats the accusative case marked NP as the subject of the embedded clause, although it is standardly assumed that these are transitive constructions with an accusative direct object. Recall that we found no principled reason to separate causatives from transitives with the suffix *-ür*, and no empirical evidence suggesting that they should be assigned separate characterisations. It therefore seems all the more appropriate that the accusative case should be expressed as an instruction on the first argument without making reference to notions such as subject of embedded clause and object of surface clause, these having no theoretical status. This way we avoid having two characterisations for what seems to be computationally the same process.

Now let us look at how a causativised transitive is represented. At this stage I shall simply assume that the causative construction forms a single database, a position I shall provide motivation for in section 4.331 below. A sentence like (23) maps onto the logical characterisation given in (23'):

- (23) Ahmet Ayşe-ye süt-ü iç-ir-di.
 -DAT milk-ACC drink-CAUS-PAST

Ahmet made Ayşe drink the milk.

(23')

		S_a	
		GOAL $w_1: x, w_2: y, \dots w_n: z \vdash f(w_1 \dots w_n) : t$	
Ahmet	1.	Ahmet' : e	ASSUMPTION, USE LAST
Ayşe	2.	Ayşe' : e	ASSUMPTION
-ye	3.	$f_{dat}(Ayşe': e)$ = Ayşe' : e	USE \neg (FIRST OR LAST)
süt	4.	süt : e	ASSUMPTION
-ü	5.	$f_{acc}(süt': e)$ = süt' : e	USE FIRST
iç	6.	$\lambda x \lambda y [iç' (x)(y)] : e \rightarrow (e \rightarrow t)$	ASSUMPTION
	7.	$\lambda y [iç' (süt')(y)] : e \rightarrow t$	MP 6,4
	8.	$iç' (süt')(Ayşe') : t$	MP 2,7
-ir	9.	$\lambda \Phi \lambda z [ir' (\Phi)(z)] : t \rightarrow (e \rightarrow t)$	ASSUMPTION
	10.	$\lambda z [ir' (iç' (süt')(Ayşe'))(z)] : e \rightarrow t$	MP 8,9
	11.	$ir' (iç' (süt')(Ayşe'))(Ahmet') : t$	
-di	12.	CHOOSE $s_a = s_j, s_j < s_{utt}$ $s_j: ((ir' (iç' (süt')(Ayşe'))(Ahmet')) : t$ $s_j < s_{utt}$	

The proof proceeds in a similar fashion to the previous one in (22') except for the additional argument and the dative marker. The instruction given by the dative is clear: it forces its adjacent NP to be the argument to combine at a point where it is neither the initial nor the final argument in a chain of arguments to combine, just as the accusative requires its adjacent NP to be the first to combine.

It is significant to see that the instructions given by the accusative marker map onto well-formed logical configurations irrespective of whether it marks an object or a

subject. In (22), it marks the causee which is the external argument of the root verb. In (23) it marks the internal argument of the root verb. But the proof is blind to this factor, as the accusative case marker specifies that it be so.¹³

4.331 The status of the embedded clause

In this section we shall try to understand whether there is any motivation for representing causative constructions as nested databases, this being a means of representing subordinate clauses as discussed in section 3.123. The reason for raising this issue comes from various analyses in the literature where the functional complex associated with the root verb is standardly referred to as an embedded clause (cf. Shibatani 1976, Baker 1988). One of the points we shall be interested in is whether the term clause used in this sense has theoretical status in LDS.

Let us assume that a sentence such as (22) ('Ayşe made Ahmet fall') is represented as containing a nested database in the following manner.

(24)

		S_a	GOAL $w_1: x, w_2: y, \dots w_n: z \vdash f(w_1, \dots, w_n) : t$	
Ayşe	1.	Ayşe' : e	ASSUMPTION (USE LAST)	
Ahmet	2.	S_b Ahmet' : e	ASSUMPTION	
-i	3.	$f_{acc}(\text{Ahmet}' : e)$ = Ahmet' : e	USE FIRST	
düş	4.	$\lambda x [\text{düş}'(x)] : e \rightarrow t$	ASSUMPTION	
	5.	$\text{düş}'(\text{Ahmet}') : t$	MP 2,4	
-ür	6.	$\lambda \Phi \lambda z [\text{ür}'(\Phi)(z)] : t \rightarrow (e \rightarrow t)$	ASSUMPTION	
	7.	$\lambda z [\text{ür}'((\text{düş}'(\text{Ahmet}'))(z))]: e \rightarrow t$	MP 5,6	
	8.	$((\text{ür}'(\text{düş}'(\text{Ahmet}')))(\text{Ayşe}')) : t$	MP 1,7	
-dü	9.	CHOOSE $S_a = S_j, S_j < S_{utt}$ $s_j: ((\text{ür}'(\text{düş}'(\text{Ahmet}')))(\text{Ayşe}')) : t$ $S_j < S_{utt}$		

Before looking at the theoretical consequences of representing the embedded functional complex as a separate database we would like to point out to a theory internal consideration relating to (24), namely why the proof proceeds despite the fact that there is a *t* in line 5 considering that this signals the fulfilment of the goal. The answer to this comes from the requirement that all information in a database contributes to the reasoning process. If the proof stopped at line 5 there would be a number of unused premises (in lines 1 and 6 as well as the contribution of the tense morpheme), violating Relevance theoretic assumptions which require all premises to be used. Therefore the reasoning process cannot stop after line 5. Another query might be what the signal for starting a sub-routine in line 2 is. Unlike, say, in English where the signal is the presence of a verb which lexically takes a sentential complement, or the presence of *that*, there is no such indication here. A nominative NP followed by an accusative NP systematically occurs in transitive clauses, and could not be taken as the marker for building a new database. This problem can be solved if we assume that proofs have a look-ahead mechanism which helps in providing the requisite steps in reasoning. Such a mechanism is necessary for languages which have left branching structures in general. In short, there seems to be no theory internal reason for not having an embedded clause.

However, our main inquiry here is whether such a step has any theoretical consequences. It would have theoretical consequences if it marked the presence of a separate domain over which inferences could be run. If we were able to show that the presence or absence of a subroutine (an embedded database) had empirically testable consequences we would be in a position to argue for or against the presence of such a subroutine. For the purposes of exposition, we shall assume that the term 'embedded clause' can be translated into the LDS framework as a nested database as shown in (24).

In the literature on causativity, a number of tests have been used to investigate the clausal nature of causative constructions. These tests have generally been formulated in the following manner: if a process *x* applies separately to the embedded clause and

the matrix clause, then causative constructions are bi-clausal; if not, they are mono-clausal. Predictably, causatives turn out to be bi-clausal with respect to some tests and mono-clausal with respect to others, rendering the predictive power of these tests defective. Below we shall present a few of these tests without going into formal analyses, only to demonstrate that these provide conflicting evidence for the clausal nature of causatives. The tests which have been used include the effects of temporal/aspectual construal, adverbial modification and binding domains (cf. Shibatani 1976, Aissen 1979, Baker 1988, Li 1990).

We first look at what temporal and aspectual modification tells us about the clausal nature of causatives. As it stands, there is only one set of temporal/aspectual marker in these constructions and the functional complex created by the root verb cannot have a separate temporal/aspectual construal. Notice that this is not simply a morphological constraint as argued by Li (1990) (see section 1.215). Let us illustrate by comparison with periphrastic causatives of the kind given in (1c) at the beginning of this chapter. Consider (25):

- (25) Zeynep [Emine-yi yarın konser-de şarkı söyle-me]-ye
 [-ACC tomorrow concert-LOC song sing-GER]-DAT
zorl-uyor sabahtan beri.
force-PROG all morning
Zeynep has been forcing Emine all morning to be able to sing at the concert
tomorrow.

This construction has two verbs, and although there is no tense or aspect morpheme on the lower verb, it can be construed as having a separate temporal characterisation from the causative, as the presence of the adverbs shows. Next consider (26):

- (26) *Zeynep Emine-ye yarın konser-de şarkı söyle-t-iyor
 -DAT tomorrow concert-LOC song sing-CAUS-PROG
 sabahtan beri.
 all morning

Here, in contrast, the two time adverbials create ungrammaticality. Even if we were to suppose that the causative complex predicate did not contain dual inflectional specification due to morphological reasons, we would not be able to explain the exclusion of dual adverbial modification. In fact languages systematically fail to have double inflectional elements on such complex verbs. If we take temporal specification as a possible indication for clausal structure, then we would have to say that causatives are mono-clausal in this respect; in our terms we would have to abandon the proposal which analyses causatives as containing a subroutine.

If we followed this line of reasoning, the presence of some adverbials, by contrast, would indicate that causative constructions are biclausal, on the assumption that adverbial scope is a criterion for defining a clause (cf. Cooper 1976). To give an example, a sentence in Turkish, corresponding to the Japanese (18), would be ambiguous:

- (27) Şiir-i çocuklar-a üç kere oku-t-tu-m.
 poem-ACC children-DAT three times read-CAUS-PAST-1
 (i) I (once) made the children read the poem three times.
 (ii)*I three times made the children read the poem (once).
 (iii) I three times made the children read the poem three times.

The adverb here could either modify the root verb or the root verb together with the causative predicate, this forcing us to reinstall the representation of a subroutine.

In a similar manner, anaphoric dependencies could be taken as an indication of the monoclausal status of causative constructions.¹⁴ Consider the following contrast between a periphrastic causative (28) and a morphological one:

- (28) *Ben Hasan-ın kendim-i yıka-ma-sı-ni sagla-dı-m.
 I -GEN myself-ACC wash-GER-POSS-ACC cause-PAST-1
 Intended reading: I made Hasan wash myself.

In a morphological causative though, there is no such problem:

- (29) Ben Hasan-a kendim-i yıka-t-tı-m.
 I -DAT myself-ACC wash-CAUS-PAST-1
 I made Hasan wash myself.

Using these data as evidence, Aissen (1979) points out that a first or second person reflexive anaphor (which behaves like the English reflexive anaphor) is 'clause-bound' and cannot refer to an element from a different clause.^{15 16} This would support the view that causative constructions do not contain embedded databases.

The examples we have given above constitute conflicting evidence with respect to the clausal nature of a causative suffix. Anaphoric dependencies and tense seem to show that causatives are monoclausal, but adverbial modification involving some adverbs shows that they are biclausal. Moreover there are cross-linguistic variations in the effect of certain processes on the two functional complexes.¹⁷ Such processes, therefore, fail to provide any conclusive evidence about the status of the embedded functional complex, rendering the representation of a separate subroutine purposeless. It is not surprising that adverbs, temporal/aspectual markers and anaphors do not provide a unitary account: in LDS all three processes are different in kind: adverbs are database extenders, temporal/aspectual markers are database labels and reflexive

anaphors are lexically specified as picking their reference from a domain which is subject to cross-linguistic variation. Moreover, the increased richness of label plus formula and label plus database provides a number of intervening categories. We do not have the binary distinction as to whether it is a clause or not. I therefore conclude that the only sense in which causatives are biclausal is in terms of their predicate-argument structure, hence there is no theoretical reason at this stage to assume that they contain nested databases, nor is there any empirical evidence to substantiate this claim.

4.34 Outline of lexical properties

The lexical properties of case markers, which are stated as side conditions on proof construction are as follows:

- (30) nominative: $f_{\text{nom}}(x:e) = \langle x, \text{use last} \rangle : e$
 (31) accusative: $f_{\text{acc}}(x:e) = \langle x, \text{use first} \rangle : e$
 (32) dative: a. $f_{\text{dat}}(x:e) = \langle x, \text{use } \neg (\text{first or last}) \rangle : e$
 b. $e \rightarrow ((e \rightarrow t) \rightarrow (e \rightarrow t))$

There is one more specification which has to be amended to the representation of the causative concerning the +human status of causees mentioned in 1.214. Recall that in a causative sentence, the dative marked causee was interpreted as +human, forcing an interpretation where *bulldozer* below would have to be personified:¹⁸

- (33) ?Bulldozer-e ev-i yık-tır-dı-m.
 bulldozer-DAT house-ACC demolish-CAUS-PAST-1
 I made the bulldozer demolish the house.

Such sentences were taken to be counterarguments for an analysis which had an underlying D-structure representation.

The +human restriction does not apply to all causees but only to those marked

dative, as exemplified by the following:

- (34) Kalem-i düş-ür-dü-m.
pencil-ACC fall-CAUS-PAST-1
I dropped the pencil.
- (35) Tren-i kaç-ır-dı-m.
train-ACC escape-CAUS-PAST-1
I missed the train.
- (36) Ateş-i sön-dür-dü-m.
fire-ACC put out-CAUS-PAST-1
I put out the fire.

It is clear that whichever variant of the causative suffix is used, the effect is the same: the accusative marked causee is not interpreted +human in Turkish, showing that this specification is confined to the dative marked causee. Such a specification can be stated as a side condition:

- (37) $\text{HOLD } V(x)(y):t \text{ iff HUMAN } (x)^{19}$

We have so far investigated the basic properties of the causative construction. In the remainder of this chapter we shall look at other factors interacting with the representation of causativity.

4.4 Aspects of argument structure

4.41 Word order and double datives

In the characterisation we provided above the dative case had two distinct specifications: it was either the marker of the causee, or the marker for an adverbial, one which

usually denoted a goal or an experiencer. We now have to specify how the choice between these two specifications is to be made, given a pair of sentences such as the ones below:

- (38) Pencere-ye cam-ı tak-tır-dı-m.
window-DAT glass-ACC fit-CAUS-PAST-1
I had someone fit the glass on the window.

- (39) Ayşe-ye cam-ı tak-tır-dı-m.
-DAT glass-ACC fit-CAUS-PAST-1
I had Ayşe fit the glass (on the window).

Taking the dative marker to give instructions regarding the order of combination of arguments will give incorrect results in (38), just as considering it the marker of an adverbial would in (39). (38) does not pose a serious problem because we know that among the specifications of the causative suffix there is the restriction that the dative causee is +human. But there is nothing to stop *Ayşe* in (39) from being interpreted as an adverbial. In such instances we rely on categorial mismatches to induce the correct interpretation. The interpretation process involves reasoning in context. If we wrongly combine, say, *Ayşe* as an adverbial we will get the interpretation 'I had someone fit the glass on Ayşe', only interpretable metaphorically. This is logically allowed of course, but it will induce a category mismatch ensuing from the semantic properties of the lexical items involved. In cases where there is such a category mismatch, the dative marked NP will be interpreted as a causee. It is significant that the two interpretations are not ordered in any way. The principle of relevance guarantees that only the appropriate one is recoverable.

However, suppose we have a sentence with two datives and no category mismatches of any sort, one of the dative marked NPs being the causee and the other

an adverbial, both with +human specification. How do we get the correct interpretation then? In this case word order is the additional factor that plays a role in interpretation.²⁰ Consider the following:

- (40) Babam-a çocuklar-a masal anlat-**tır**-dı-m.
 my father-DAT children-DAT story tell-CAUS-PAST-1
 (i) I had my father tell stories to the children.
 (ii) *I had the children tell stories to my father.

In such constructions, the adverb is linearly closer to the verb than the causee. Similar facts are attested in other languages.²¹ However, when one of the dative marked NPs is postposed, linear order ceases to be a factor in determining the function of each dative marked NP, and phonological phenomena such as stress pattern, intonation and pausing become relevant factors:

- (41) Çocuklar-a masal anlat-**tır**-dı-m babam-a.
 children-DAT story tell-CAUS-PAST-1 my father-DAT
 (i) I had my father tell stories to the children.
 (ii) I had the children tell stories to my father.

In fact, stress is a significant factor that affects the acceptability of such sentences. I therefore conclude that word order in double dative causatives is free other than in cases such as (40), and the correct interpretation is derived from phonetic factors such as stress, intonation and pause. I leave the characterisation of such factors in constructing a logical representation for further research.

4.42 Putative irregularities in case marking

There are a group of verbs which do not display the regular case-marking pattern of causative constructions. The paradigm example of such verbs is psychological

predicates. Other verbs, as has been observed by Dede (1981), Erguvanlı (1979), Gibson and Özkaragöz (1981) and Kornfilt (1990a), also display certain irregularities in their cases when appearing as the embedded clause in a causative construction. We shall take each type in turn.

4.421 Psychological predicates

A number of verbs denoting psychological states do not display the regular case marking pattern of one-place predicates when causativised. These verbs are *kork/ürk* 'fear', *gücen/kız* 'be cross/angry with' and other similar verbs.²² I shall refer to these verbs as psychological predicates. Recall that the matrix subject in the causative construction does not correspond to any of the NPs in the embedded functional complex. When a (simplex) clause with a one-place predicate is causativised its nominative marked NP occurs as the accusative marked NP in a causative. And the nominative marked NP of the causative construction does not correspond to anything in the simplex clause:

(42)	<u>Simplex</u> <u>Clause</u>		<u>Causative</u> <u>Construction</u>
	Nom	→	Acc (causee)
			Nom

In contrast, if the simplex clause contains a psychological predicate, then the nominative marked NP of its causative counterpart corresponds to an ablative/dative marked adverbial in the simplex clause:

(43)	<u>Simplex</u> <u>Clause</u> (with psychological predicate)		<u>Causative</u> <u>Construction</u>
	Nom	→	Acc (causee)
	Dat/Abl	→	Nom

Let us illustrate the difference between (42) and (43). Consider first an ordinary one-place predicate with an ablative adverb:

- (44) John pencere-den düş-tü.
window-ABL fall-PAST
John fell out of the window.

When the verb is causativised, the clause in (44) appears embedded under the causative as in (45), and the ablative case marker on the adverb is retained:

- (45) Bill John-u pencere-den düş-ür-dü.
-ACC window-ABL fall-CAUS-PAST
Bill made John fall out of the window.

Now consider sentences with psychological predicates which are seemingly identical to (44), in that both have one-place predicates, and both have ablative/dative adverbs:

- (46) Ben Namık-tan kork-tu-m.
I -ABL fear-PAST-1
I feared Namık.
- (47) Ben Namık-a kız-dı-m.
I -DAT be angry with-PAST-1
I was angry with Namık.

The difference, however, is that when (46) and (47) are causativised the ablative/dative NP does not retain its status as an adverb, as witnessed by the ungrammaticality of (48). Instead, it appears as the subject of the causative construction, as in (49):

b. *Zehra ben-i Namık-a kız-dır-dı.
I-ACC -DAT be angry with-CAUS-PAST

(49) a. Namık ben-i kork-ut-tu.
I-ACC fear-CAUS-PAST

b. Namık ben-i kız-**dır**-d_i.
I-ACC be angry-CAUS-PAST

And predictably, an ordinary one-place predicate is ungrammatical if it conforms to the causativisation pattern of a psychological predicate as in (49):

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We should immediately point out that we are not trying to explain how a causative predicate is derived from a psychological root verb, in other words, we are not proposing a derivational account. Rather, we shall look at what properties render (48a) and (48b) ungrammatical, and the reasons for the difference in grammaticality between (49a-b) on the one hand and (50) on the other. Notice that there is no difficulty in mapping psychological causatives onto a logical representation. The properties of case, together with the characterisation we have assigned the causative predict the grammaticality of such constructions, and they can be represented without any problem in the logic of LDS. Take, for example, a sentence like (51):

- (51) Ayşe Ahmed-i kork-ut-tu.
 -ACC scare-CAUS-PAST
 Ayşe frightened Ahmet.

This sentence is represented as follows:

(51')

		s_a	
		GOAL $w_1: x, w_2: y, \dots w_n: z \vdash f(w_1, \dots, w_n) : t$	
Ayşe	1.	$Ayşe' : e$	ASSUMPTION (USE LAST)
Ahmet	2.	$Ahmet' : e$	ASSUMPTION
-i	3.	$f_{acc}(Ahmet':e)$ $= Ahmet' : e$	USE FIRST
kork	4.	$\lambda x [kork'(x)] : e \rightarrow t$	ASSUMPTION
	5.	$kork'(Ahmet') : t$	MP 2,4
-ut	6.	$\lambda \Phi \lambda z [ut'(\Phi)(z)] : t \rightarrow (e \rightarrow t)$	ASSUMPTION
	7.	$\lambda z [ut'((kork'(Ahmet'))(z))] : e \rightarrow t$	MP 5,6
	8.	$(ut'(kork'(Ahmet'))(Ayşe')) : t$	MP 1,7
-tu	9.	CHOOSE $s_a = s_j, s_j < s_{utt}$ $s_j: (ut'(kork'(Ahmet'))(Ayşe')) : t$ $s_j < s_{utt}$	

(51') is configurationally identical to (22') above, which is the causative of a one-place predicate. However (51'), unlike (22'), imposes additional restrictions on the presence

of an ablative, namely, it does not allow one unless the database contains certain elements with certain properties to be discussed subsequently.

Does the peculiarity of psychological causatives follow from the properties of psychological predicates or from the ablative/dative marked element? I suggest that it is directly associated with the ablative/dative case marked elements and has little to do with the argument structure of the predicate itself. In other words, I would like to rule out the possibility that the peculiarity of psychological predicates has anything to do with the declarative information of the verb itself. That is, psychological predicates are identical to one-place predicates in terms of argument structure. The psychological predicates we have looked at in this section do not behave any differently from ordinary predicates, other than in terms of the difference relating to causativisation, mentioned above. It seems to be a language-specific property of Turkish when compared to say, Romance psychological predicates that these are not like the unaccusative/ergative verbs discussed in Perlmutter 1978 and Burzio 1986.²³ Nor do they show any similarity to the class of "psych-verbs" analysed in Belletti and Rizzi (1988) which are claimed to be distinctly different from transitive verbs. The psychological predicates we are looking at here have none of the properties of such psych-verbs, which by claim, have derived subjects, cannot induce an arbitrary pro interpretation, and cannot passivise or be embedded under a causative construction. Turkish psychological predicates like *kork* 'fear' and *kız* 'be angry with' fail to display any of these characteristics, although some other verbs in Turkish may do so.²⁴

Looking at the issue from a slightly different perspective, namely from the point of view of the behaviour of the adverbial element, also forces us to conclude that psychological predicates have the same argument structure as ordinary predicates, and that the ablative/dative adjunct cannot be considered as part of the argument structure of the verb. Assuming that the ablative/dative element is part of the argument structure of the verb is untenable: the psychological verbs which are investigated here are one-

place predicates which exhibit the passivisation pattern of ordinary one-place predicates. When passivised, they lack an overt subject as is the case with one-place predicates, and the dative/ablative case marked element retains its case-marker. This shows that they have a single argument slot, that which is filled by their external arguments. Thus the adverbial NP cannot be an internal argument.²⁵ It is therefore reasonable to assume from the behaviour of the psychological predicates that their argument structure is no different from ordinary predicates and that the adverbial is not part of the argument structure of these verbs.

What is it then that bars the occurrence of such adverbials with psychological causatives? A closer look at the data reveals that what is going on vis-a-vis the difference in grammaticality of seemingly similar constructions (such as (45) and (48a)) is a direct result of the interpretation associated with the adverbial and its compatibility with the other pieces of information in the database. Here we shall only look at the ablative, but the same analysis can be applied to the dative. An ablative NP can be interpreted distally, as marking the beginning of an action or it can denote the cause of an action.²⁶ One can argue that these two interpretations are loosely connected, that if an action is associated with a cause, then that cause necessarily marks the beginning of that action. It could then be said that on this account, the latter construal is interpretively related to the former. For present purposes we shall take this as a starting point for our analysis. It will be seen that giving a unified account for such adverbials can be quite easily represented, and that this generalisation lends itself to a straightforward characterisation in LDS. Now a causally construed ablative cooccurring with a psychological causative is ungrammatical because causative sentences already contain causes, namely the matrix subject. Therefore these lead to cases which resemble a theta-criterion violation, as those cited in Grimshaw (1990). This does not mean that ablative adverbs cannot occur with psychological causatives; it only means that when they do they cannot be construed as causes. In fact what we have just said is not only limited to psychological causatives but all causatives. Below is a sample of

sentences with various (non-psychological) predicates where the ablative denotes causality.

- (52) a. John tetanoz-dan öl-dü.
 tetanus-ABL die-PAST
 John died of tetanus.

- b. John gürültü-den uyan-dı.
 noise-ABL wake up-PAST
 John woke up because of the noise.

- c. John rulet-i çaresizlik-ten oynuyor.
 roulette-ACC desperation-ABL playing.
 John is playing roulette out of desperation.

And significantly, when these constructions occur as the complement of the causative, the subject of the causative corresponds to the ablative adjunct, just as in psychological predicates:

- (53) a. Tetanoz John-u öl-**dür**-dü.
 tetanus -ACC die-CAUS-PAST
 Tetanus killed John.

- b. Gürültü John-u uyan-**dır**-dı.
 Noise -ACC wake up-CAUS-PAST
 The noise woke John up.

- c. Çaresizlik John-a rulet oyna-t-ıyor.
 desperation -DAT roulette play-CAUS-PROG
 Desperation is making John play roulette.

And just as in psychological causatives an ablative adverb in these sentences cannot be construed causally:

- (54) *Tetanoz John-u hastalık-tan öl-dür-dü.
 tetanus -ACC illness-ABL die-CAUS-PAST
 (Tetanus killed John because of illness.)

- (55) *Gürültü John-u heyecan-dan uyan-dır-dı.
 noise -ACC anxiety-ABL die-CAUS-PAST
 (Noise woke John up because of anxiety.)

Since the only possible construal for the ablative in (54) is a causal one it clashes with the subject which is also a cause. Notice that the causal reading of the ablative is imposed not by the verb, but by the semantic properties of the word *hastalık* 'illness'.

The sentences in (53) thus display an identical pattern with psychological causatives. This is not surprising, as the subject of the causative construction is the causer of an action. This same cause is expressed by means of the ablative in simple clauses. Recall that the representation of the sentences in (53) is exactly the same as that of (51') above.

We said above that ablative adverbs can occur with causatives as long as they are not construed causally. This is true both of psychological causatives and of ordinary ones. Consider the sentences below:

- (56) a. Zehra ben-i camin arkasin-dan kork-ut-uyor.
 I-ACC window behind-ABL fear-CAUS-PROG
 Zehra is frightening me from behind the window.

- b. Ayşe Ahmed-ı çaresizlik-ten kork-ut-tu.
 -ACC desperation-ABL fear-CAUS-PAST.

Out of desperation, Ayşe made Ahmet fear.

- (57) a. Gürültü John-u yatak-tan fırla-t-tı.
 noise -ACC bed-ABL jump-CAUS-PAST

The noise made John jump out of bed.

- b. Ben çürük elmalar-ı John-a çaresizlik-ten ye-dir-di-m.
 I rotten apples-ACC -DAT desperation-ABL eat-CAUS-PAST-1

I made John eat the rotten apples out of desperation.

These examples show that as long as an adverbial is construed non-causally it can occur in a causative clause.

We can now turn to the characterisation of causatives with ablative adverbials, and see how the difference in grammaticality between (57a) and (57b) is represented.

- (58) Ayşe Ahmed-ı çaresizlik-ten kork-ut-tu.
 -ACC desperation-ABL fear-CAUS-PAST.

Out of desperation, Ayşe made Ahmet fear.

- (59) *Ayşe Ahmed-ı karanlık-tan kork-ut-tu.
 -ACC darkness -ABL fear-CAUS-PAST.

Intended reading: Ayşe made Ahmet fear the dark.

Following Kempson (p.c.) we take the view that adverbs are database extenders which are directly represented in the database label. Suppose that the database label is more complex in terms of information content that we have so far assumed. In particular, let

us suppose that it contains information that locates the functional complex in a flow of time, that describes its spacial properties or the manner in which it was performed. Such information can be represented as a set of points in time with variables $t_1 \dots t_n$ and in the case of spatial properties as a set of locations $l_1 \dots l_n$. Such representations provide the possibility of expressing relations between ordered pairs $\langle t_i, t_j \rangle$ and $\langle l_i, l_j \rangle$ in any such set. The label may even contain, in the case of causal interpretations a set of causal variables $c_1 \dots c_n$, although we shall not commit ourselves at this point to having two sets denoting similar functions, one for causal interpretation and the other for spatial interpretation. However, following suggestion by Kempson (p.c.) we might instead construe the causal interpretation of such adjuncts as some interpretive use of a location (or "source") based on our assumption that the causal interpretation can be stated as the interpretive use of the spatial interpretation. To represent this we postulate that all ablative adjuncts map onto a locative specifying variable, relevance determining whether the construal of the variable is to be interpretive or not. The label of the database will then contain the sets $\langle t_1 \dots t_n, l_1 \dots l_n \rangle$. This wealth of representations is not a problem considering the identification of these variables will provide precise inferential content.

A sentence like (58) can now be represented as follows:

(61)

		s_a	
		$\langle l_1 \dots l_n \rangle$	
		$karanlık_{abl}$	
		GOAL $w_1: x, w_2: y, \dots w_n: z \vdash f(w_1, \dots, w_n) : t$	
Ayşe	1.	Ayşe' : e	ASSUMPTION (USE LAST)
Ahmet	2.	Ahmet' : e	ASSUMPTION
-i	3.	$f_{acc} (Ahmet':e)$	
		= Ahmet' :e	USE FIRST
kork	4.	$\lambda x [kork' (x)] : e \rightarrow t$	ASSUMPTION
	5.	$kork' (Ahmet') : t$	MP 2,4
-ut	6.	$\lambda \Phi \lambda z [ut' (\Phi)(z)] : t \rightarrow (e \rightarrow t)$	ASSUMPTION
	7.	$\lambda z [ut' ((kork' (Ahmet'))(z))]: e \rightarrow t$	MP 5,6
	8.	$(ut' (kork' (Ahmet')) (Ayşe')) : t$	MP 1,7
-tu	9.	CHOOSE $s_a = s_j, s_j < s_{utt}$	
		$s_j: (ut' (kork' (Ahmet')) (Ayşe')) : t$	
		$s_j < s_{utt}$	

To summarise, acceptability here depends purely on the interpretation allowed by the presence of a subject and the meaning of the ablative. This is a perfect case of the role of on-line decision making and its effects on well-formedness. The desired results simply follow from general mechanisms of deductive reasoning without having to resort to additional configurational constraints.

4.422 Quasi transitives

There are a few verbs in Turkish which sometimes behave like transitives and sometimes like intransitives. The verb *inan* 'believe' in (62a) is a one-place predicate in Turkish, which is indicated by the fact that it does not have an accusative marked argument. (Hence it passivises like a one-place predicate.) When causativised, it displays the regular case marking pattern (accusative case marking for the causee) as in (62b) below, but as a second option case marks its causee as dative, as in (62c) (cf. Erguvanlı 1979, Zimmer 1988).²⁷

- (62) a. Ali sözüm-e inan-ma-dı.
 my word-DAT believe-NEG-PAST
 Ali didn't believe my word.
- b. Ali-yi sözüm-e inan-**dır**-a-ma-dı-m.
 -ACC my word-DAT believe-CAUS-MOD-NEG-PAST-1
 I couldn't make Ali believe my word.
- c. Sözüm-ü Ali-ye inan-**dır**-a-ma-dı-m.
 my word-ACC -DAT believe-CAUS-MOD-NEG-PAST-1
 I couldn't make Ali believe my word.

The problem with this verb is that although it behaves like a one-place predicate with respect to passivisation and causativisation, it optionally adopts an additional strategy of causativisation, namely that which is indicative of two-place predicates. Let us begin analysing the constructions above with a reminder of how the case-marking properties of one-place predicates and two place predicates correspond to the case-markers in the causative construction:

- (63) a. One-place predicates b. Two-place predicates
- | <u>Simplex</u>
<u>Clause</u> | <u>Causative</u>
<u>Construction</u> | <u>Simplex</u>
<u>Clause</u> | <u>Causative</u>
<u>Construction</u> |
|---------------------------------|---|---------------------------------|---|
| Nom → | Acc (causee) | Nom → | Dat (causee) |
| Dat → | Dat | Acc → | Acc |
| | Nom | | Nom |

Starting with *inan* 'believe' type verbs, these behave, on the one hand, just like one-place predicates as expected, conforming to the pattern in (63a). On the other hand, they

adopt a second strategy similar to (63b). Notice that the accusative marked argument of a two-place predicate retains its case marker when causativised. *Inan* type verbs do not have an accusative marked argument because they are one-place predicates; nevertheless when causativised, it is the dative marked adjunct which appears with accusative case marking. The causative of *inan*, then, has the case marking properties of a two-place predicate although the root verb itself is not one. For clarification, consider an ordinary two-place predicate like *unut* 'forget':

- (64) a. Ali din-i unut-tu.
 religion-ACC forget-PAST
 Ali forgot (about) religion.
- b. Ali-ye din-i unut-tur-du-m.
 -DAT religion-ACC forget-CAUS-PAST-1
 I made Ali forget (about) religion.

Comparing this construction with (65) which has *inan* 'believe', one can immediately see that the case marking properties of the complex predicates in (64b) and (65b) are identical, although the case marking properties of the root verbs are different as exemplified in (64a) and (65a):

- (65) a. Ali söz-üm-e inan-dı.
 word-POSS1-DAT believe-PAST
 Ali believed my word.
- b. Ali-ye söz-üm-ü inan-dır-dı-m.
 -DAT word-POSS1-ACC believe-CAUS-PAST-1
 I made Ali believe my word.

It appears, then, that *inan*-type verbs display the pattern in (64a) but in addition they have (66) as a causativisation pattern:

- (66) Nom → Dat
 Dat → Acc
 Nom

Let us call verbs that display pattern (66) "quasi transitive" verbs for ease of exposition. Similar effects can be observed in constructions with the verb *bak* which means 'look at' and 'treat/take care of/look after' the two senses of which gives different results when causativised. In sentences where *bak* means 'look at', such as (67a) taken from Erguvanlı (1979), case marking is as expected:

- (67) a. O kitaplarım-a bak-tı.
 s/he my books-DAT look at-PAST
 S/he looked at my books.
- b. O-(n)u kitaplarım-a bak-tır-dı-m.
 s/he-ACC my books-DAT look at-CAUS-PAST-1
 I made him/her look at my books.

But when *bak* means 'look after/treat' the case marking corresponding to (67b) is ungrammatical, and instead, the causee gets dative case marking, a factor that normally identifies the root verb as a two-place predicate:

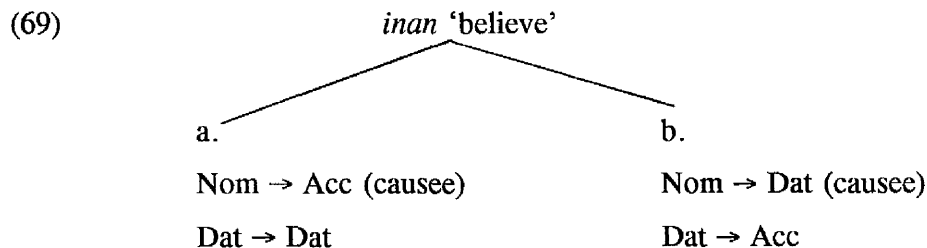
- (68) a. O dişlerim-e bak-tı.
 s/he my teeth-DAT treat-PAST
 S/he treated my teeth.

- b. *O-(n)u dişlerim-e bak-**tır**-dı-m.
 s/he-ACC my teeth-DAT treat-CAUS-PAST-1
 (Intended reading: I had him/her treat my teeth.)

- c. O-(n)a dişlerim-i bak-**tır**-dı-m.
 s/he-DAT my teeth-ACC treat-CAUS-PAST-1
 I had him/her treat my teeth.

Again, like *inan* 'believe', this verb conforms to the causativisation strategy both of one-place predicates and of two-place predicates.

Before trying to analyse the argument structure of quasi-transitives, it might be useful to look at some further properties of *bak* 'look at/treat', given above. This verb has properties identical to *inan* 'believe', in that it conforms both to (63a) and (66). The difference, though, is that each pattern in the case of *bak* corresponds to the two different senses of this verb: (63a), the pattern adopted by one-place predicates, occurs with *bak* meaning 'look at', and the quasi-transitive pattern (66) occurs with the other sense of the verb, 'treat'. As a first approximation, we can state the difference between *inan* 'believe' and *bak* 'look at/treat' as the former having a single lexical entry which has two strategies, and the latter as having two separate lexical entries with a different strategy for each entry.



- | | |
|--|--|
| <p>(70) <i>bak1</i> (look at)</p> <p style="margin-left: 100px;"> </p> <p style="margin-left: 80px;">Nom → Acc (causee)</p> <p style="margin-left: 80px;">Dat → Dat</p> | <p><i>bak2</i> (treat)</p> <p style="margin-left: 100px;"> </p> <p style="margin-left: 80px;">Nom → Dat (causee)</p> <p style="margin-left: 80px;">Dat → Acc</p> |
|--|--|

Assuming that (69) and (70) are descriptively correct, how do we represent them? There are two points to clarify:

- 1- Is the peculiarity of the case marking pattern of these verbs due to a property of the verbs themselves? If so, what additional factor is needed in the lexical specification of these verbs, and how is it to be stated?
- 2- Are the case specifications given above in 4.22 sufficient in capturing the differences, or are further specifications needed in the lexical entry of case markers?

As a starting point let us assume that the answer to the first question is in the affirmative, i.e. that there must be additional factors in the lexical representation of these verbs which yield the peculiarities mentioned above. Suppose that the dual representation of *bak* 'look at/treat' rests upon the difference in the logical properties of *bak1* and *bak2*:

- | | |
|---|---|
| <p>(71) <i>bak1</i> (look at)</p> <p style="margin-left: 80px;">$e \rightarrow t$</p> | <p><i>bak2</i> (treat)</p> <p style="margin-left: 80px;">$e \rightarrow (e \rightarrow t)$</p> |
|---|---|

Consider a sentence like:

- (72) Mary John-u Bill-e bak-tır-dı.
- ACC doctor-DAT look at/treat-CAUS-PAST
- a. Mary made John look at Bill.
 - b. Mary made Bill treat John.

The logical configuration of (72a) is given below.

(72a')

		s_a	Goal: $w_1: x, w_2: y, \dots, w_n: z \vdash f(w_1 \dots w_n) : t$	
Mary	1.	Mary' : e	ASSUMPTION (USE LAST)	
John	2.	John' : e	ASSUMPTION	
-u	3.	$f_{acc}(\text{John':e})$ = John' :e	USE FIRST	
Bill	4.	Bill' : e	ASSUMPTION	
-e	5.	$e' : e \rightarrow ((e \rightarrow t) \rightarrow (e \rightarrow t))$	ASSUMPTION	
	6.	Bill-e' : $(e \rightarrow t) \rightarrow (e \rightarrow t)$	MP 4,5	
bak1	7.	$\lambda x [\text{bak1}'(x)] : e \rightarrow t$	ASSUMPTION	
	8.	$(\lambda x [\text{bak1}'(x)])(\text{Bill-e'}) : e \rightarrow t$	MP 6,7	
	9.	$(\text{bak1}'(\text{John'}))(\text{Bill-e'}) : t$	MP 8,2	
-tir	10.	$\lambda \Phi \lambda z [\text{tir}'(\Phi)(z)] : t \rightarrow (e \rightarrow t)$	ASSUMPTION	
	11.	$\lambda z [\text{tir}'((\text{bak}'(\text{John'}))(\text{Bill-e'}))(z)] : e \rightarrow t$	MP 9,10	
	12.	$\text{tir}'((\text{bak}'(\text{John'}))(\text{Bill-e'}))(\text{Mary}) : t$	MP 11,1	
-di	12.	CHOOSE $s_a = s_j, s_j < s_{utt}$ $s_j: (\text{tir}'(\text{bak}'(\text{John'}))(\text{Bill'}))(\text{Mary})) : t$ $s_j < s_{utt}$		

The specification of the accusative case marker in line 3 gives correct results, in that it predicts its adjacent NP as being the internal argument of *bak1*. As for the specification of the dative marker, recall that it has dual specification, and here can only be an adverb. If we were to choose the dative as marking an argument it would remain unidentified the reason being that the verb *bak1* has only one argument slot. Therefore we are forced to interpret it as an adverb.

Turning now to the (b) interpretation of the string in (71), the logical representation is as follows:

(72b')

		S_a	Goal: $w_1: x, w_2: y, \dots, w_n: z \vdash f(w_1, \dots, w_n) : t$	
Mary	1.	Mary' : e	ASSUMPTION (USE LAST)	
John	2.	John' : e	ASSUMPTION	
-u	3.	$f_{acc}(\text{John'}:e)$ = John' : e	USE FIRST	
Bill	4.	Bill' : e	ASSUMPTION	
-e	5.	$f_{dat}(\text{Bill'}:e)$ = Bill' : e	USE \neg (FIRST OR LAST)	
bak	6.	$\lambda x \lambda y [\text{bak}'(x)(y)] : e \rightarrow (e \rightarrow t)$	ASSUMPTION	
	7.	$\lambda y [\text{bak}'(\text{John'})(y)] : e \rightarrow t$	MP 6,2	
	8.	$\text{bak}'(\text{John'})(\text{Bill'}) : t$	MP 7,4	
-tir	9.	$\lambda \Phi \lambda z [\text{tir}'(\Phi)(z)] : t \rightarrow (e \rightarrow t)$	ASSUMPTION	
	10.	$\lambda z [\text{tir}'(\text{bak}'(\text{John'})(\text{Bill'}))(z)] : e \rightarrow t$	MP 8,9	
	11.	$\text{tir}'(\text{bak}'(\text{John'})(\text{Bill'}))(\text{Mary'}) : t$	MP 10,1	
-di	12.	CHOOSE $S_a = S_j, S_j < S_{utt}$ $S_j: (\text{tir}'(\text{bak}'(\text{John'})(\text{Bill'}))(\text{Mary'})) : t$ $S_j < S_{utt}$		

Here again, the logical specification of the accusative marker gives correct results. For the dative marker, we have to choose the option which marks an argument as the causee.

Stating the verb *bak* 'look at/treat' as two separate lexical items, provides an answer for questions 1 and 2. For the representation of *bak1* and *bak2*, stating that they have different logical properties for the two different senses is sufficient; nothing more has to be said about the properties of case markers.

Let us see if we can analyse *inan* 'believe' in a similar fashion. Apart from the fact that there is no motivation for having two lexical items for *inan* (since it does not have two distinguishable senses), we would be making wrong predictions. If we did assume that *inan* 'believe', in addition to having the type-specification $e \rightarrow t$ was specified as $e \rightarrow (e \rightarrow t)$, the latter specification would yield a causative which, on a par with (72b)

would mean 'I made my word believe Ali', which this sentence does not. Therefore it is not possible to claim that *inan* 'believe' is a two-place predicate. But if we assume that *inan* 'believe' is a one-place predicate, an $e \rightarrow t$, how can we explain the causativisation pattern which conforms to (63b)? Notice that committing ourselves to a single specification for *inan* 'believe' forces us to treat the dative NP as an adjunct.

Replacing the NP *sözüm* 'my word' with an NP with a human referent reveals that although the root verb *inan* 'believe' does not specify its adjunct in terms of its selectional properties, the complex verb *inan-dır* 'believe-CAUS' does. The dative marked NPs in causative sentences with *inan-dır* are limited to a few words. Notice that this phenomenon is different from a verb having its own selectional restrictions; the causative complex has selectional restrictions which the root verb does not have. For example, the causative sentence in (73b) can be considered to be "derived" from (73a), whereas, (74b) cannot be taken as a "derived" form of (74a):

- (73) a. Ahmet sonunda Allah-a/bu haber-e *inan*-dı.
 finally God-DAT/this news-DAT believe-PAST
 Ahmet finally believed (in) God/the news.
- b. Ahmet-i sonunda Allah-a/bu haber-e *inan-dır*-dı-m.
 -ACC finally God-DAT/this news-DAT believe-CAUS-PAST-1
 I finally made Ahmet believe (in) God/the news.
- (74) a. Ahmet sonunda Ayşe-ye *inan*-dı.
 finally -DAT believe-PAST
 Ahmet finally believed Ayşe.
- b. *?Ahmet-i sonunda Ayşe-ye *inan-dır*-dı-m.
 -ACC finally -DAT believe-CAUS-PAST-1

where (74b) can only be interpreted if *Ayşe* is construed as a non-person, the name of a computer programme, or the like.

I suggest therefore, that in addition to *inan* 'believe', a one-place predicate, there is an additional verb *inan-dır* 'believe' which is a two-place predicate with semi-idiomatic properties, and is separately listed in the lexicon. This is why the causative segment does not logically behave like a causative. Consider again the relevant examples:

- (75) a. Ali sözüm-e *inan*-ma-dı.
 my word-DAT believe-NEG-PAST
 Ali didn't believe my word.
- b. Ali-yi sözüm-e *inan-dır*-a-ma-dı-m.
 -ACC my word-DAT believe-CAUS-MOD-PAST-1
 I couldn't make Ali believe my word.
- c. Sözüm-ü Ali-ye *inan-dır*-a-ma-dı-m.
 my word-ACC -DAT believe-MOD-NEG-PAST-1
 I couldn't make Ali believe my word.

(75b) is a complex predicate with an intransitive root verb and it follows the expected pattern. The verb in (75c) is not a complex predicate but a lexicalised form of it, which has lost its causative properties. It is simply an underived transitive verb. We can conclude, then, that there is no such causativisation pattern (66) which can be said to exist with *inan* 'believe', under the assumption that a separate verb *inandır* exists.

In fact, this appears to be the case with yet another verb, *benze* 'resemble', which seems to employ both the strategies (63a) and (66).²⁸ Again there are two

separate lexical characterisations involved, *benze-t* 'to make someone resemble', and *benzet* 'to liken', the former a complex verb, but the latter a two-place predicate which is unanalysable combinatorially.

(76) a. Ali Napolyon-a benz-iyor.

-DAT resemble-PROG

Ali resembles Napoleon.

b. Ali-yi Napolyon-a benze-t-ti-m.

-ACC -DAT resemble-CAUS-PAST-1

i. I likened Ali to Napoleon.

ii. I likened Napoleon to Ali.

iii. I made Ali look like Napoleon.

(76b) indicates that if the verb is taken to be a complex predicate, then there is no peculiarity in the case marking system, it is as in (63a). As for the strategy in (66), nothing more needs to be said once we assume that *benzet* 'liken' is a separate entry.

It is not surprising to find causative suffixes which no longer retain their logical properties and which have merged with verbs. Some of the verbs mentioned in section 4.22 on lexical causatives are also of this kind. Only they no longer have analysable counterparts, and the causative segment in some have also gone through vocalic change.

To summarise, *bak* has two separate lexical entries ((*e*→*t*) and *e*→(*e*→*t*)) concomitant with the two senses of the verb; *inan* is a one-place predicate, and *inandır* is an unanalysable two-place predicate.²⁹

4.423 Partitive case marking in causatives

We have argued so far that cases have lexical properties which play a part in inducing logical configurations. Case markers give instructions as to where, and at what stage of a derivation the argument projected from an NP is to attach. In particular, accusative case marking was specified as forcing its adjacent NP to be the first to combine out of a chain of premises of type *e*. There appears to be another case marker which has similar properties to the accusative case marker: the ablative case marker in its partitive use. Ablative case marked partitives behave like the internal argument of two-place predicates. It should be remembered that the internal argument of two-place predicates is normally accusative and when causativised, the causee appears with dative case marking. The same effects are observed when a two-place predicate with a partitive case marked NP is embedded under the causative (taken from Kornfilt 1990a):

- (77) a. Ali pasta-dan/pasta-yı ye-di.
 cake-ABL/cake-ACC eat-PAST
 Ali ate (some of) the cake.
- b. Ali-ye pasta-dan/pasta-yı ye-dir-di-m.
 -DAT cake-ABL/cake-ACC eat-CAUS-PAST-1
 I made Ali eat (some of) the cake.
- c. *Ali-yi pasta-dan ye-dir-di-m.
 -ACC cake-ABL eat-CAUS-PAST-1

The properties of the partitive-ABLative in Turkish were first pointed out by Dede (1981) who concluded that NPs bearing this case were direct objects. One piece of evidence she used in order to support this claim was the behaviour of partitive--ablatives in causative constructions. Dede observed that when a partitive-ablative occurred in a causative sentence, its effect in the sentence was identical to the presence

of an accusative, in that the causee appeared with dative case marking as in (78b), rather than with accusative case marking as in (79):

- (78) a. Ban-a pasta-(y)_i ye-**dir**-di-ler.
 I-DAT cake-ACC eat-CAUS-PAST-3pl
 They made me eat the cake.

- b. Ban-a pasta-dan ye-**dir**-di-ler.
 I-DAT cake-ABL eat-CAUS-PAST-3pl
 They made me eat (some) of the cake.

- (79) *Ben-i pasta-dan ye-**dir**-di-ler.
 I-ACC cake-ABL eat-CAUS-PAST-3pl

The argument was that if the partitive-ABLative case marker were to refer to something other than a direct object, the causee would be bearing the accusative case marker. The question is, are these ablative marked partitives really internal arguments as implied by Dede (1981)?

First of all, in our analysis of case, the properties of each case marker are stated independently in its lexical specification. In other words, the presence (or absence) of a case marker in a construction does not hinge on the presence of other case markers. Otherwise, we would not be able to assign an interpretation to constructions with missing arguments. Therefore the dative case marking of the causee in (78) has nothing to do with the properties of the partitive-ablative, but is an indication that its adjacent argument is the external argument of the root verb. As for the partitive-ablative, there is nothing in principle which prevents us from saying that it, too, like the accusative case marker gives instructions to its adjacent NP to be the first to combine. But this is empirically inadequate for a number of reasons. First of all not all two-place predicates

can occur in constructions which have partitive-ablative direct objects. Some verbs are marginally grammatical with this case marker, while others are downright incorrect:

- (80) a. ?Ben bu ağaç-tan Amerika-da gör-dü-m.
 I this tree-ABL -LOC see-PAST-1
 (I saw of this tree (trees of this kind) in America.)
- b. *Ben bu tip film-ler-den sev-er-im.
 I this type film-PL-ABL like-AOR-1
 (Intended reading: I like films of this kind.)

Secondly, as observed by Kornfilt (1990a), the partitive-ablative case can appear on the subject of some verbs:

- (81) a. Biz-de bu kitap-tan kal-ma-dı.
 We-LOC this book-ABL remain-NEG-PAST
 We haven't got any (copies) of this book left.
- b. Biz-e bu mektup-tan gel-di.
 we-DAT this letter-ABL come-PAST
 A letter (of this kind) has come to us. (We received a letter of this kind.)

The partitive-ablative case can, in fact occur in any structural position because it does not mark any of the arguments of a verb. What it does mark is quantification, and therefore can appear in an NP regardless of the position this NP occupies in a sentence, as illustrated below.

- (82) a. Pasta-dan iki dilim ye-di-m.
 cake-ABL two slice eat-PAST-1
 I ate two slices of the cake.
- b. Biz-e bu mektup-tan iki tane gel-di.
 we-DAT this letter-ABL two come-PAST
 Two letters (of this kind) have come to us. (We received
 two letters of this kind.)

Examples (81) and (82) show that the partitive-ablative case cannot be considered to encode the structure building properties similar to the properties of the accusative case marker, since it can occur both on objects and on subjects. Moreover, as (83) shows, it marks the relation between two NPs just like a genitive marker. In fact most constructions with the partitive-ablative can be paraphrased using the genitive marker:

- (83) Pasta-nın iki dilim-i-(n)i ye-di-m.
 cake-GEN two slice-POSS-ACC eat-PAST-1
 I ate two slices of the cake.

In other words, unlike the accusative marker, it lacks the property of instructing its adjacent NP to take part in a proof at a specific point in the derivation. Rather, it is a marker encoding the semantic properties of quantification in noun phrases.

We hope to have shown in this subsection that the seemingly odd instances of case marking can be accounted for in the framework of LDS. The ablative case marker in causative constructions affects the grammaticality of these constructions only if their semantic properties and those of the verbs are taken into account. The behaviour of the dative and the accusative case markers in causatives with *inan* 'believe' and *bak* 'look at, treat' can be attributed to the idiosyncratic properties of these verbs. As for the

partitive use of the ablative case, this occurs within an NP and is not by itself part of the argument structure of a verb.

4.43 Cross-linguistic irregularities

Turkish is quite a regular case marking language vis-a-vis argument structure and the way we have represented the lexical properties of case accounts for the data we have dealt with. We have assumed that nominative, accusative and dative cases each provided a specific instruction relating to the position of its adjacent argument in a logical configuration. With some of the case markers, it is no surprise that there can be two distinct specifications subject to be chosen on line by looking at other properties in a configuration. This was, indeed, shown to be the case with the dative marker which can either instruct its adjacent argument to combine at a point where it is neither the initial nor the final one, or, alternatively, to turn its adjacent NP into an adverbial, on a par with prepositions and postpositions in other languages. Other cases such as the ablative were shown only to induce inferential effect. Since languages have a limited number of case markers, some ambiguity at the lexical level is expected.

What is also expected is that case marking properties should differ cross-linguistically. Some languages, like Chinese have no morphological case markers, while others such as Latin or Turkish may have up to six or seven. It should be of no surprise, then, that the function of a case marker can only be understood within the case system of that specific language; attributing universal properties to case markers is bound to create generalisations which cannot be maintained cross-linguistically. For example, what is called the accusative case has quite distinct properties in Turkish, Japanese and Quechua. In Turkish it marks its adjacent argument as being the first to combine (in the most local domain) when there is a chain of arguments. In Japanese, the accusative case, although specifying its adjacent argument to be the first to combine, does so irrespective of whether there are other arguments. This is best illustrated by passive constructions:

- (84) Mary ga John ni kunsyoo o atae-rare-ta
 TOP by medal ACC give-PASS-PAST

Mary was given a medal by John.³⁰

(From Kuno 1973, cited in Baker 1988)

The NPs *Mary* and *John* are not arguments here. *Mary* is a topic which does not relate to any of the positions in the argument structure of the verb *give*. As for *John*, although this is the agent of the action, it is an adverb which is optional configurationally. Therefore the only argument in (84) is the accusative *kunsyoo* 'medal'. This shows that the accusative case in Japanese can direct an NP to the first point at which an argument has to combine, irrespective of the absence of others. The difference in Turkish and Japanese with respect to the lexical specification of the accusative is that the former depends on the notion 'within a chain of arguments' while the latter does not. In Quechua, the accusative case has yet another property. Apart from marking the first argument to combine, it can also mark a small clause NP as in (85a), a manner adverb as in (85b) and a temporal adverb as in (85c):

- (85) a. Pay-ta waqcha-ta tari-rqa-ni.
 he-ACC orphan-ACC find-PAST-1
 I encountered him as an orphan.
- b. Chay-ta allin-ta-n ruwa-rqa-nki.
 that-ACC good-ACC do-PAST-2
 You did it well.
- c. Qayna-ta Qusqu-ta ri-rqa-ni.
 yesterday-ACC Cuzco-ACC go-PAST-1
 Yesterday I went towards Cuzco.

(From Muysken 1981)

One would have to look at the whole case system in Quechua to be able to assign a specific characterisation to the additional function of the accusative. Maybe it has a type specification like the one the dative has in Turkish. The important point is that its specification as providing a side condition would not be sufficient to explain its properties in this language.

Alternatively, a case marker may not necessarily have properties which instruct arguments to combine at certain steps. In Icelandic, for example, there are four case markers, each of which can appear on the subject depending on the idiosyncratic properties of the verb:

- (86) a. Ég hjálpaði honum.
I(NOM) helped him.

(From van Valin 1991)

- b. Hana vantaði vinnu.
she(ACC) lacked job
She lacked a job.

- c. Henni leidist.
she(DAT) bored
She was bored.

- d. Hennar var getið.
she(GEN) was mentioned
She was mentioned.

(From Sigurðsson 1991)

Sigurðsson (1991) notes that the nominative, accusative, dative and genitive marked NPs in (86) are surface subjects. If we adapted our analysis to the Icelandic subject, we

would have to conclude that all the case markers had the property of instructing the premises projected from the NPs that host them to be the last to combine in a database, a position which of course could not be maintained. But Sigurðsson also points out that the subjects in (86b-d) are derived objects. This would mean that their respective case markers signal the D-structure status of the arguments. Hence, in this instance case markers could be taken to indicate the position of an argument within the predicate argument structure, rather than giving combinatorial instructions to premises in a database. Case marking would in these instances be providing inferential information rather than giving instructions for structure building. Structure building, then, is only one of the functions of case marking. The indication for subjecthood in Icelandic is probably linear order, this being a language which has rigid word order.

Similarly, in Japanese, the sole function of case marking does not seem to be the specification of the stage at which an argument is to combine.³¹ Different case markers occur with identical arguments in sentences which induce the two senses of causativity, on being permission, the other being the more neutral cause:

- (87) a. Haha wa watashi o Tokyo ni ika-se-ta.
 mother TOP I ACC DAT go-CAUS-PAST
 Mother caused me to go to Tokyo.
- b. Haha wa watashi ni ika-se-ta.
 mother TOP I DAT go-CAUS-PAST
 Mother let me go.

We would have to know much more about case marking properties in these languages to be able to suggest an analysis. What is significant is to see that case marking lends itself to a procedural analysis as the one suggested in here.

Languages which do not have any overt case marking like a number of Bantu languages, or those which have little case marking like English use word order as a means of assigning positions to arguments. In the case of Icelandic, then, we can assume that word order is the principal bearer of this function, and that case markers do not specify the order in which arguments are combined but refer directly to how a root verb marks its argument. As Sigurðsson points out, Sentences like (85c) are identical in case marking to their active counterparts.³² It cannot then be true that a case-marker imposes an order onto a derivation. It merely means that case markers have a different role in these languages: they refer directly to the argument structure of the root verb, hence resemble fossilised structures.

We now turn briefly to ergative languages. As with the case markers in accusative/nominative system, the case marking properties in ergative/absolutive systems differ from one language to another. Languages which have ergative and absolutive case markers sometimes also have accusatives and nominatives (see Jelinek 1984). First let us look at how an absolutive/ergative system works. In Pashto, the direct object of a transitive verb, as in (88c) has the same case marking as the subject of its intransitive counterpart, and both are in the ergative. The subject of a transitive verb is marked absolutive; hence being a subject is not, in itself, a factor that guarantees a certain case marker:³³

- (88) a. Saray walwid.
 man(ERG) fell(MAS)
 The man fell.
- b. Da shesha walwida.
 the glass(ERG) fell(FEM)
 The glass fell.

- c. Sari da shesha wagherzawala.
 man(ABS) the glass(ERG) dropped
 The man dropped the glass³⁴

As a first approximation one can say the following about these case markers: the ergative case in Pashto directs its adjacent argument to combine initially in a proof, irrespective of the fact that there are other arguments. The absolutive, on other hand is the last to combine *if there are other premises present in the database*. So this case system, from the point of view of procedural information seems to be the reverse of Turkish. In Turkish marking a premise as the first to combine is dependent on the presence of an additional argument, but in Pashto it is the last to combine that is sensitive to this factor.

Georgian, another ergative language, displays yet different properties. The case system in Georgian is linked to the tense and agreement systems in quite a complicated way (cf. Anderson 1984). Here I shall take sentences in the third person which occur with a particular group of tenses, the Series I tenses. Anderson notes that there are four verb classes, three of which are given below:

- (89) a. Ivane-m mc'er-i mo-k'l-a.
 John-ERG insect-NOM killed
 John killed the insect.
- b. Ivane mo-k'vd-a.
 John-NOM died.
 John died.

c. K'at'a-m ik'navl-a.

cat-ERG meowed.

The cat meowed.³⁵

(From Anderson 1984)

The subjects of transitive verbs in Georgian have ergative case. Their direct objects appear with nominative case marking, this being the case which also marks the subjects of the so-called medial intransitives as in (89b). So it appears that the nominative case in Georgian directs its adjacent argument to combine initially, irrespective of the presence of a chain of arguments. Now there is another class of intransitives (morphologically and semantically distinct from medial transitives) which have subjects in the ergative case, given in (89c). The ergative case can then be specified as directing its adjacent argument to combine finally, again irrespective of whether there is a chain or not. These specifications account for the facts given in (89) directly. They predict that an ergative and a nominative can both be subjects, which is, in fact, what happens.

A schematic representation of what we have said about nominative/accusative cases and absolutive/ergative cases is given below:

(90)	when in a chain of arguments	irrespective of chain
First to combine	ACC _{TURKISH}	ERG _{PASHTO} NOM _{GEORGIAN}
last to combine	ABS _{PASHTO}	NOM _{TURKISH} ERG _{GEORGIAN}

In sum, we have tried to show the following: case marking is the expression of the relationship between an argument and a predicate, providing instructions (in the form of side conditions) which direct an argument to a specific point at which it takes part in the combinatorial process. Alternatively cases mark adverbs, in which case they have a type specification. Being specified as lexical properties it is expected that languages will have a varying number of case markers, with varying functions. But the main proposal here relating to the representation of case marking extends to all languages.

4.5 Conclusion

In this chapter I have argued that the causative affix has declarative content and has the type specification $t \rightarrow (e \rightarrow t)$. I also questioned the use of the terms biclausal and monoclausal, arguing that these terms have been considered to be incompatible due to the shortcomings of the models in which causatives were analysed. The janus nature of causative constructions are directly captured in the framework of LDS: what has been seen as biclausal is reflected in the type specification of the causative affix; and its so-called monoclausal aspects are reflected in the database which does not contain an embedded (nested) database. The method of analysis suggested here reconciles the complex and the simplex structure of causatives, and moreover does so at a single level of representation. I also discussed case markers as instructions on building structure, and argued that the nominative, accusative and one instantiation of the dative case had such properties.

NOTES

1. This is a productive process with a few exceptions. The causative suffix does not attach to some verbs denoting psychological states such as *anla* 'understand', *bil* 'know', *üz* 'sadden', *sık* 'bore' and *dokun* 'upset'.
2. These figures include the unproductive *-zir* which occurs only with one verb (Ergin 1962 and Adalı 1979) and in any case does not behave like a causative, as well as *-DEr* which survives in one dialect (Ergin 1962) and is the form which is used in some lexical causatives.
3. Although some researchers (cf. Timurtaş 1964) consider *-t* an allomorph of *-Dİr*, its status as a causativiser is not questioned.
4. Banguoglu (1974) considers *-t* and *-It* to be the same morpheme, but others (Bainbridge 1980, and Lewis 1967) consider them separate.
5. Some sources including Banguoglu (1974) cite *-Ir* as a predecessor of *-Dİr*, this latter being formed by merging the suffixes *-It* and *-Ir*. The merging has, by claim, occurred after the vowel in *-It* dropped and it combined with *-Ir* to form *-Dİr*. Another merged form of the same morphemes formed *-İrt*. Although Banguoglu claims that *-It* is obsolete as a causative suffix it does occur in modern Turkish as witnessed by *ak-ut* 'cause to flow', *ürk-üt* 'scare', *kork-ut* 'frighten', *sark-ut* 'let down', and others.
6. This variant is in free variation with *-Art*. See Sebüktekin (1971).
7. See Cooper (1976), among others, and references in notes 1-4.
8. Other languages display this property as well. In Japanese (Miyagawa 1989) the "permission" sense of the causative cooccurs with a dative causee which would normally bear the accusative case.
9. It is not clear whether the second interpretation includes a reading in which the action denoted by the root verb is also modified by the adverb, nor is it clear whether the adverb can modify both predicates simultaneously. Considering that a cause presupposes

that an action has taken place, it should not be possible to *cause* an action three times while having the action itself take place only once.

10. Proper names in LDS are treated as underdetermined elements which we shall not dwell upon here.

11. The lack of overt case marking does not exclusively signal a subject but also a preverbal direct object which refers to a generic entity, as explained in section 1.112. In such cases whether the function to be chosen has the USE FIRST or USE LAST specification is decided by word order. In cases where there is a single argument with no case marker, this argument may be construed either as the subject or the object.

12. My intuitions as a native speaker do not support the claim that Aissen and Hankamer (1980) make regarding the ungrammaticality of sentences with missing subjects, given below:

- (i) Antrenör koş-tur-du.
coach run-CAUS-PAST
The coach made x run.

- (ii) Memur otobüs-e bin-dir-di.
conductor bus-DAT get on-CAUS-PAST
The conductor made x get on the bus.

Aissen and Hankamer judge these sentences as ungrammatical and conclude that causative verbs are strictly subcategorised for a direct object which is obligatory. However, these sentences are perfectly grammatical when taken as answers to questions such as:

- (iii) Kim koşturdu sporcuları?
Who made the athletes run?
- (iv) Nerede yolcular?
Where are the passengers?

When a referent is supplied in the discourse, there is no obligation imposed on the expression of a direct object here.

13. Another reason why such a specification is preferable is because together with the properties of the root verb, it characterises the position of the accusative marked NP in sentences like the following:

- (i) Tavuk-lar-ı ye-dir-di-m.
 chicken-PL-ACC eat-CAUS-PAST-1
 a. I made (someone) eat the chicken.
 b. I made the chicken eat.

The interpretation of (a) depends on the construal of the root verb as a two-place predicate whereas (b) has a one-place predicate.

14. The status of anaphoric and pronominal reference is an issue in its own right which we shall not go into here. The reader is referred to Özsoy (1983), Kornfilt (1984b) and Kennelly (1990) for a discussion of these issues in Turkish.

15. This specification might not be sufficient in explaining the distribution of reflexive anaphors in Turkish, since linear restrictions seem to affect grammaticality as well. Consider the following:

- (i) John_i Mary-e_j kendisi-ni_{i/j} anlattı.
 -DAT self-ACC talk about
 John_i talked about self_{i/j} to Mary_j.
- (ii) John_i kendisi-ni_{i/*j} Mary-e_j anlattı.
 self-ACC -DAT talk about.
 John_i talked about self_{i/*j} to Mary-e_j.

Linearity plays a role in the interpretation of pronominals as well (cf. Erguvanlı-Taylan 1986).

16. A related issue concerns the identification of a domain. What is it that makes the embedded verbal complex an opaque domain with respect to anaphoric interpretation in

(28) but not in (29)? It cannot be tense because the embedded verb in (28), like the causative in (29) does not contain a tense element. However, unlike the morphological causative construction the temporal construal of the embedded clause in periphrastic causatives is independent of the temporal specification of the main verb. This supports the claim that the embedded construction in (28) is an opaque domain. If tense does not define opacity, what does? Drawing on a number of constructions, George and Kornfilt (1981) argue that this other factor is the subject agreement morpheme. The presence of an agreement morpheme, rather than tense, is what they claim defines finiteness. Brendemoen and Csato (1984) also suggest that the head of S' is agreement. If these claims are correct, then the transparency of the embedded verbal complex in the causative construction might be due to the lack of an agreement morpheme. This would mean that in embedded clauses, the subject agreement marker labels a subbox, and this constitutes the opaque domain. We leave this matter for further research.

17. For example the ambiguity created by negation in Uighur and Turkish does not hold in Kinyarwanda where the sequence V-CAUS-NEG necessarily implies that the action denoted by the root verb was not carried out (cf. section 1.215). There may be some processes that only affect the embedded verbal complex, some which affect only the domain created by the causative, and there may be some which obligatorily affect both.

18. Similar restrictions in causative constructions occur in other languages, such as Mongolian (see section 1.214), some Bantu languages (Cooper 1976) and Hungarian, where impersonal verbs cannot be causativised (Hetzron 1976). The +/- human factor seems to be significant in other constructions as well (cf. van Oosten 1980), Turkish impersonal passives being one such construction. An example for the presence of this factor in English is given by Chomsky (1991b), who observes that 'one' and 'PRO' (such as in *to roll down a hill*) have an animate reading.

19. HOLD is a metalanguage predicate for expressing relations that are truth-dependent. A side condition containing this specification is an inference rule constraining the interpretation of a given relation.

20. Double datives usually occur in causative constructions. To my knowledge there are only two simplex verbs in Turkish that allow double datives, the verbs *mal olmak* and *patlamak* both meaning 'to cost', and these require even more stringent word order restrictions.

21. In the few examples of double dative constructions in other languages the adverb is linearly closer to the verb than the causee. See Comrie (1976) for examples from Mongolian and Punjabi.

22. There are about seven or eight such verbs: *ürk* 'fear', *utan* 'be ashamed of', *çıldır* 'be irritated/infatuated', *bık/bez/bunal* 'be fed up with', for example.

23. Earlier analyses of psychological verbs can be found in Perlmutter (1978) and Burzio (1986). They suggest that these verbs fail to assign case to their complements, which are then forced to move to the (non-thematic) subject position. Hence the D-structure representations of such "unaccusative" verbs differ from that of ordinary transitives in that their subject position is empty at this level.

24. The verbs mentioned in note 1 in this chapter may be of this kind.

25. Another option would be to assume that they have a Davidsonian event variable (Higginbotham 1985, Kratzer 1990) or an event structure which interacts with argument structure (Grimshaw 1990). The status of verbs with event variables is not altogether clear. Higginbotham (1985) assumes that all verbs contain an event variable as part of their argument structure. Kratzer (1990) classifies verbs in terms of whether they have an event variable or not, those which do being stage-level predicates. The group of psychological predicates we are dealing with here behave like stage-level predicates, although other verbs such as *bil* 'know', *anla* 'understand' behave like individual-level predicates (for example, they cannot be modified by a location). Although this classification may be valid, it is not clear how it would explain the behaviour of the ablative/dative marked argument vis-a-vis causativisation. If the psychological predicates discussed here are stage-level predicates and contain an event variable, one would have to give an explanation as to why the event variable would systematically correspond to

the subject of the causative whereas in other stage-level predicates (such as 'eat', 'watch', 'sit'), this is only one of the possibilities.

26. The ablative also has the function of marking partitive case, which will be discussed in section 4.423.

27. For some native speakers other verbs (e.g. *tap* 'worship') has identical properties to *inan* 'believe', cf. Knecht (1985) and Özkaragöz (1986b).

28. These examples are taken from Erguvanlı (1979) which discusses the similarities between this verb and *inan* 'believe'. The analysis suggested there rests on the pragmatic notion of prominence of topicalisation.

29. A problem remains with *bak2* 'treat' which has the logical type $e \rightarrow (e \rightarrow t)$. The problem is that unlike all other two-place predicates in Turkish which have their internal arguments systematically case marked as accusative, the internal argument of *bak2* is dative. Note that the dative marked argument of this verb may become the subject when passivised (as in (ib) below), in complete parallel with the passivisation of two-place predicates, indicating that this is indeed its internal argument:

- (i) a. Doktor hastane-de ban-a bak-tı.
 doctor hospital-LOC I-DAT treat-PAST
 The doctor treated me in hospital.

- b. Ben hastane-de bak-ıl-dı-m.
 I(NOM) hospital-LOC treat-PASS-PAST-1
 I was treated in hospital.

Alternatively, (ia) can be passivised as in (ii) which displays the passivisation pattern of one-place predicates, with the dative retaining its case and treated as an adverbial. The evidence that it is an adverbial rather than a subject comes from the absence of agreement on the verb:

- (ii) Ban-a hastane-de bak-ıl-dı.
 I-DAT hospital-LOC treat-PASS-PAST

I was treated in hospital.

When passivised, *bak2* displays ambivalence: it adopts the strategy employed by both two-place predicates and one-place predicates; furthermore it behaves like two-place predicate when causativised but like a one-place predicate as a root verb. All we can say about this verb is that it is a two-place predicate with specifications overriding those of the dative case marker, such that this latter optionally assumes the properties of the accusative case marker. We leave the properties of this verb for further analysis.

30. Japanese does not have morphological case marking, but the postpositional clitics have the same function.

31. I am grateful to Richard Ingham from bringing to my attention the relevant Japanese data.

32. This also seems to be the case in other languages, cf. Lawler (1977). See also Chapter VI for similar cases in Japanese.

33. Case marking in Pashto interacts with tense/aspect as well. See Khattak (1988) for further examples.

34. I am indebted to Akhtarian Kohistani for clarifying some points about Pashto.

35. I have omitted the translation of the inflectional elements on the verb. The reader is referred to Anderson 1984 for further detail.

CHAPTER V

COMPLEX PREDICATES AND ARGUMENT STRUCTURE 2: PASSIVES AND REFLEXIVES

5.1 Introduction

There is considerable cross-linguistic variation in the way languages distinguish between passive, middle and reflexive constructions. It is often the case that a single term covers a variety of constructions in one language without necessarily corresponding to a similar set in another language. This is as much due to the difficulty of finding a morphological or syntactic factor that uniquely distinguishes one construction from the others, as it is to ascribing to any one of the terms a cluster of properties by which one could provide a universal characterisation. In other words, not only are there differences between, say, the properties of passivisation in various languages, but there is also considerable overlap between each construction within a single language in terms of sensitivity to syntactic phenomena and morphological properties. Such factors make it very difficult to use the terms reflexive, passive and middle as guidelines even at a descriptive level.

Conceptually, these terms cover a variety of constructions which share a common feature: that one of the arguments of the verb is thought to be pragmatically insignificant or irrelevant enough not to be overtly expressed. The syntactic analogue of this property is the suppression of one of the arguments of the verb. It seems to be appropriate, then, to exploit this shared property as a basis for checking the significance of particular factors in identifying each construction.

In this chapter I will argue that there is a logical distinction between reflexives on the one hand and constructions which have generally been called passives and middles on the other. As for the difference between passives and middles in Turkish, it will be shown that there is no morphological or syntactic distinction between these two which can be stated within the grammar, and that what is called passive is no more

than a restricted interpretation of the middle reading. We shall therefore start by assuming that there are just two sets of morphemes which have the effect of suppressing one of the arguments of the verb: the passive and the reflexive. In section 5.2 we shall provide a description of the basic properties of passives and reflexives. Section 5.3 will involve the representation of passivisation and processes which interact with it. In section 5.4 we shall look at arguments against the postulation of a separate middle construction for Turkish. Finally in section 5.5 we shall characterise reflexivisation.

5.2 Passives and reflexives in Turkish

There are two suffixes in Turkish which occur in sentences that have passive, middle and reflexive readings: *-il* and *-(i)n*. The former is taken to be the canonical passive and the latter the canonical reflexive morpheme. However, the fact that *-il* has *-(i)n* as one of its variants and that both converge on a "middle reading" can create confusion. Consider the following sentences:

- (1) Kapı aç-**ıl**-dı.
 door open- -PAST-3
 a. The door was opened.
 b. The door opened.

- (2) Çocuklar yıka-**n**-dı.
 children wash- -PAST-3
 a. The children were washed.
 b. The children washed themselves.

- (3) Çok öv-**ün**-dü-n.
 much praise- -PAST-2
 You praised yourself a lot.

- (4) Çok öv-ül-dü-n.
 much praise- -PAST-2
 You were praised a lot.

In (1) *-il* has a passive and a middle reading, but in (4) it only has a passive reading. In (2) *-(i)n* has a passive and a reflexive reading but in (3) it only has a reflexive reading. Traditional grammars mention the various "meanings" of these constructions, and a more recent work (Bainbridge 1987) argues for two *-(i)n/-il* pairs, which would require *-il* and *-(i)n* each to be represented in the lexicon twice: $[-il/-(i)n]_1$ which, in our terms, represents passive and $[-il/-(i)n]_2$ which represents middle/reflexive (*-il* being the middle morpheme while *-(i)n* is the reflexive morpheme).¹ Although this claim captures an interesting insight relating to the complementarity of middle and reflexive readings, I will argue in section 5.3 that it does not lead one to postulate a separate middle morpheme.

5.21 Morphological properties

As explained above, the passive and the reflexive suffixes in Turkish look conspicuously similar. On the basis of their phonological similarity, one might be tempted to argue that there is a single *-(i)n* suffix in Turkish whereby the ambiguity in (2) could be attributed to extra-grammatical factors, or one could argue that the ambiguity is represented grammatically and there are two *-(i)n* suffixes in Turkish. That the second alternative is the correct one can be substantiated by the presence of minimal pairs such as the one in (3) and (4). It is difficult to find many examples that display this kind of complementarity, due to the infrequency of the reflexive verb forms. But, in any case, the few that exist make the distinction quite clear:

- (5) a. Çocuk çabucak giy-in-di.
 child quickly wear-REF-PAST
 The child dressed (herself) quickly.

- b. Elbise çabucak giy-il-di.
 dress quickly wear-PASS-PAST
 The dress was worn quickly.

- (6) a. Adamlar döv-ün-dü.
 men beat-REF-PAST
 They beat themselves.

- b. Adamlar döv-ül-dü.
 men beat-PASS-PAST
 The men were beaten.

These constructions demonstrate that it is the distinct morphological shape of the two suffixes which induce the relevant readings. On the basis of such examples, we take it that passive and reflexive morphemes in Turkish are lexically distinct.

The passive suffix in Turkish has the following variants:

- (i) *-n* (attached to stems ending in a vowel),
- (ii) *-in* (attached to stems ending with the consonant *l*),
- (iii) *-il* (attached to stems ending with all other consonants).

With the effect of vowel harmony the passive suffix has the following forms: *-n*, *-ın*, *-in*, *-un*, *-ün*, *-il*, *-ul*, *-ül*.

The reflexive also is formed by the addition of *-in* to the verb stem, if the stem ends in a consonant, or *-n* otherwise. As in the passive, the vowel in this suffix harmonises with the preceding vowel, yielding the allomorphs *-in*, *-ın*, *-un*, *-ün* in addition to *-n*. To summarise, the concatenative properties of the passive and the reflexive suffixes are as follows:

- (i) *-n*: a. Passive (when attached to stems ending in a vowel); *ara* 'search', *aran* 'be searched'; *tara* 'comb', *taran* 'be combed'; *yıka* 'wash', *yıkan* 'be washed'.
 b. Reflexive: (when attached to stems ending in a vowel); *tara* 'comb', *taran* 'comb oneself', *yıka* 'wash', *yıkan* 'wash oneself'.
- (ii) *-in*: a. Passive (when attached to stems ending in *l*); *al* 'take', *alın* 'be taken'; *del* 'pierce', *delin* 'be pierced'.
 b. Reflexive (when attached to stems ending in consonant); *döv* 'beat', *dövün* 'beat oneself', *giy* 'dress', *giyin* 'dress oneself'.
- (iii) *-il*: Passive. *ver* 'give', *veril* 'be given'; *at* 'throw', *atıl* 'be thrown'.

5.22 The syntactic distribution of the passive and reflexive suffixes

5.221 Passive

Perhaps the most striking property of the Turkish passive is that as well as applying to two-place predicates as in (7), it can apply to one-place predicates as in (8):

- (7) a. Çocuk-lar-a hediye-ler ver-**il**-di.
 child-PL-DAT gift-PL give-PASS-PAST
 The presents were given to the children.

- b. Kağıt-lar imzala-**n**-dı.
 paper-PL sign-PASS-PAST
 The papers were signed.

- (8) a. Cumartesi piknik-e gid-**il**-ecek.
 Saturday picnic-DAT go-PASS-FUT
 On Saturday (one/people) will go on a picnic.

- b. Bu yol-dan geç-**il**-ir-se nereye var-**ıl**-ır?
 this road-ABL cross-PASS-AOR-COND where arrive-PASS-AOR
 If (one) crosses this road, where will (one) arrive at?

When the passive suffix appears with a one-place predicate as in (8a) and (8b) the construction has an impersonal reading.

There are a few restrictions on the passivisation of verbs. One of these is that the logical subject of passivised one-place predicates is obligatorily personified, whereas no such constraint applies to their non-passive counterparts:

- (9) a. İnsanlar/kediler bahçe-ye çık-tı.
 people/cats garden-DAT go out-PAST
 The people/cats went out into the garden.
- b. Bahçe-ye çık-**ıl**-dı.
 garden-DAT go out-PASS-PAST
 (one, some people)/(?the cats) went out into the garden.
- (10) a. İnsanlar/kitaplar yer-e düş-tü.
 people/books floor-DAT fall-PAST
 The people/books fell on the floor.
- b. Yer-e düş-**ül**-dü.
 floor-DAT fall-PASS-PAST
 (One)/(?the books) fell on the floor.

In (9a) and (10a), the logical subject of the verbs can refer to anything which does not semantically clash with the action described by the verb. However, as the (b) examples

show, the agent of a passivised one-place predicate is either understood as being human, or is personified.²

Another related issue is the inexpressibility of the logical subject of an one-place predicate by means of an agentive *by*-phrase, even if it is human:

- (11) a. Bahçe-ye (*insanlar tarafından) çık-ıl-dı.
 garden-DAT people by go out-PASS-PAST
 There was a going out into the garden (*by people).

- b. Yer-e (*insanlar tarafından) düş-ül-dü.
 floor-DAT people by fall-PASS-PAST
 There was a falling (*by people).

Finally, passives of one-place predicates are generally reported to be better with the aorist aspectual marker as in (12a) and (13a), as opposed to passivised one-place predicates which have specific temporal specification:

- (12) a. Soguk-ta öl-ün-ür.
 cold-LOC die-PASS-AOR
 In the cold (one) dies.

- b. ?Soguk-ta öl-ün-dü.
 cold-LOC die-PASS-PAST
 In the cold (one) died.

- (13) a. Gaz-la yan-ıl-ır mı?
 gas-INS burn-PASS-AOR INTER
 With gas, does (one) burn?

- b. ?Gaz-la yan-ıl-dı mı?
 gas-INS burn-PASS-PAST INTER
 With gas, did (one) burn?

5.222 Reflexive

The suffix *-(i)n* in (3) combines with a small number of transitive verbs. It can only combine with those expressing an action that one can inflict on oneself, but not necessarily with all such verbs. Since the concatenation of *-(i)n* with a verb is not a productive process, the verbs that can combine with it have to be specified for this suffix in the lexicon.³ The function of the reflexive suffix is to induce a reading in which there is an understood element coreferential with the subject. This "suppressed" element, so to speak, either corresponds to the internal argument of the verb as in (14), or to an oblique object as in (15) and (16):

- (14) a. Naz kendisi-ni yıka-dı.
 self-ACC wash-PAST
 Naz washed herself.
- b. Naz yıka-n-dı.
 wash-REF-PAST.
 Naz washed herself.
- (15) a. Naz kendisi-ne kokular sür-dü.
 self-DAT perfumes put-PAST
 Naz put perfumes on herself.
- b. Naz kokular sür-ün-dü.
 perfumes put-REF-PAST.
 Naz put perfumes on herself.

- (16) a. Naz elbise-yi (kendi üstü-n-e) giy-di.
 dress-ACC on self-POSS-DAT wear-PAST

Naz wore the dress (on herself).

- b. Naz giy-**in**-di.
 wear-REF-PAST

Naz dressed.

In (14b) the reflexive verb is intransitive and it triggers the suppression of the internal argument of the verb. The reflexive verb in (15b) is not intransitive as the presence of a direct object argument shows. The suppressed argument here is the oblique object which is syntactically an adjunct. In (16b), on the other hand, the direct object argument is suppressed, but this argument is not coreferential with the subject argument. The reflexivisation of the verb *giy* 'wear' involves the suppression of a postpositional phrase as well. One can conclude from these three examples that reflexivisation either suppresses the element that is construed as coreferential with the subject argument irrespective of whether this element is part of the argument structure of the verb as in (15), or it suppresses the internal argument of the verb as in (14); alternatively it suppresses both the internal argument of the verb and any other adjunct which in the non-reflexive form is construed as coreferential with the subject. These examples indicate that reflexivisation cannot be defined as the suppression of the internal argument of a verb, as has sometimes been assumed. It rather seems that it cannot co-occur with either an internal argument or an adjunct which has the semantic content of "self". We shall turn to the properties of the reflexive suffix in more detail in section 5.5.

We turn now to the analysis of passives, middles and reflexives.

5.3 The process of passivisation

Although passivisation might appear to be a process similar to causativisation in terms of its morphological distribution it does not seem appropriate to assign it a logical type specification such as is the case with the causative. The reasons for this are twofold. Firstly, assigning a logical specification to the passive morpheme is empirically inadequate for the reasons outlined in Chapter II. There it was argued that assigning the type $(e \rightarrow t) \rightarrow t$ to the passive required the additional mechanism of type lifting in order for the double occurrence of passive morphology to be accounted for. There it was shown that the first concatenation of the passive suffix formed a logical type which did not allow for a second concatenation of the passive morpheme. The only way out of this situation was argued to be type-lowering whereby the passive morpheme would have the type e , a mechanism which, for independent reasons, is not tenable. Another way of approaching the problem would be to assign the type e to the passive initially; but this way any distinction between the passive and an argument (which is of type e) would be lost. Then, such an analysis did not lend itself to stating any similarity between passivisation and reflexivisation which one might wish to capture. Notice that any such similarity which may exist between passives and reflexives in Turkish is not reducible to their function as intransitivisers: this function simply does not exist for the passive in Turkish, unless, of course, one is prepared to jettison any generalisation about the passive itself. So calling a passive or a reflexive affix an intransitiviser is undesirable both from a descriptive and theoretical point of view. However, there are other similarities between passives and reflexives which will be elaborated in section 5.4 below. Here we shall state this similarity informally: both passives and reflexives suppress the expression of an element relating in some way to the argument structure of the root verb. This generalisation will be taken as a starting point in analysing the properties of these constructions and we shall begin with the passive.

With respect to its properties in Turkish, an analysis of passivisation has to capture the following facts:

- (i) that the passive combines with n-place predicates
- (ii) that its effect is the syntactic suppression of the logical subject of the verb
- (iii) that this argument may reappear in some cases as an adverbial phrase

In order to understand the significance of such properties with respect to the analysis of passivisation, we shall briefly look at various accounts of passivisation.

5.31 An Overview

Despite being one of the most fruitful areas of research in syntactic theory, there is considerable confusion as to how a passive is to be defined, given the variety of constructions with which this term is associated cross-linguistically. As opposed to the definition of a causative which one can more easily generalise across languages, there is a basic definition problem with respect to the passive. One of the effects of passivisation is to render a constituent more prominent, a constituent which, in an active clause, would normally be unmarked. Consequently, topicalisation constructions in some languages are taken as analogues of the passive construction. For example, what Lawler (1977) suggests to be a passive in Achanese has little in common with what is understood as passive in Indo-European languages. Similarly, Noonan and Woock (1978) mention a topicalisation construction in Lango, spoken in Uganda, which clearly has little in common with what is generally known as a passive.⁴ Chinese also seems to have passives behaving like topicalised constructions. In Chinese, the only indication of a so-called "passivised" construction is the presence of a *by*-phrase, without which these constructions can lead to ambiguity. It appears, then, that what is referred to as passivisation is probably a topicalisation process.⁵ Yet another example regarding the confusion of defining passives is the possibility of passivising intransitive verbs in some languages, the so-called "impersonal constructions" and the lack of these in others. Finally, there is the difficulty of defining the remit of the passive morpheme cross-linguistically. Languages such as Greek have a single morpheme that induces the middle, reflexive, reciprocal and passive interpretations (cf. Capritsa, Göksel and

Kempson 1991), others are said to have "pseudo-passives" (Kirsner 1976, Chung 1976a), but in some languages there are separate morphemes which assume more refined functions.

Analyses of passivisation are, again, divided, as in the case of causatives. Some approaches analyse passivisation as a lexical process, while others attribute passivisation to mechanisms in the syntactic component. This division corresponds to the degree to which actives and passives are considered different from one another: if they are formed in the lexicon more differences are expected, but if they are formed derivationally in the syntax, there are thought to be more similarities. As in the case of discussions relating to the clausal nature of causative constructions, I believe that these arguments are misplaced. Although passive constructions display properties which are different from corresponding active constructions, actives and passives contain verbs with the same argument structure. Both the correspondence and the difference are directly representable in the framework we are suggesting here, as we take it that all relevant information is encoded in the lexical specification of the root verb and of the passive morpheme.

We pointed out above that one of the major issues relating to passivisation was the degree of correspondence between active and passive constructions. The reason why this issue became significant was partly due to the way passivisation was formulated in pre-Chomskian structuralist analyses as well as in early transformational grammar. The introduction of the passive transformation brought with it the issue of whether transformations preserved meaning, and led to a number of works which dealt with this issue in depth (cf. Katz and Postal 1964, Ziff 1966, Katz and Martin 1967)

Analyses which claim that passivisation is a process which takes place in the syntactic component can be traced back to the early 1960's. Passivisation occupies a special place in the history of generative linguistics as one of the first construction type

to be characterised transformationally. As mentioned above, it was claimed that passive constructions were derived transformationally from their active counterparts, this being stipulated by a rule (Chomsky 1957, among others). This approach presented difficulties with respect to the morphological structure of passivisation in English, as well as the status of the *by*-phrase. In effect, the passive transformation had too much power but relatively little content. With the advent of the principles and parameters approach (Chomsky 1981) passive constructions were analysed as the manifestation of independent principles of grammar, namely, Case and Theta Theories: the movement of a direct object NP was said to be forced as a result of the inherent inability of the passive verb to assign case to this NP. The NP then had to move to a position that could host it, which was the subject position. There it received case from inflection. Since according to the GB framework all NPs require case by the visibility condition, such a movement was obligatory. It was, however, obvious that the inability of the passive verb to assign case had to be stated somewhere. Since case, or at least "structural case" is a structurally defined surface phenomenon it had to be implemented *during* a derivation. This approach was problematic not only from a morphological point of view but also in terms of creating a structure with the *by*-phrase. It thus became necessary to attribute argument absorption as a property which could be stated in the lexicon, and in Jaeggli (1986) it was suggested that the passive particle "absorbed" the thematic role of the verb which would normally be assigned to the direct object. Despite its shortcomings, this suggestion was a welcome step within the GB approach in formalising a generalisation prevalent in passive constructions: that one of the arguments in the argument structure of a verb was barred, by lexical properties, from being expressed configurationally as an argument.

Studies in the Relational Grammar framework (Perlmutter 1978, Perlmutter and Postal 1977, 1983) also analyse passives as a manifestation of movement where the direct object is "promoted" to the subject position. One constraint against movement in Relational Grammar is that if an element has already been moved in a derivation once

then it cannot move any further. The consequences of this constraint, which is the 1-Advancement Exclusiveness Law, are crucial for the passive construction. It is claimed that the reason some verbs cannot be passivised is because they are "unaccusative": verbs which lack an underlying subject and which have their surface subject base generated in the object position. Since the object of an unaccusative verb moves once to become the subject, it cannot move any further, and passivisation cannot take place. I shall show in section 5.22 that the data is incorrect, hence, the constraint against more than one movement is empirically inadequate. I shall also argue that the impossibility of passivising some verbs is a result of their inability to have human agents, which does not require a separate characterisation.

Notice that both analyses (Transformational Grammar/GB and Relational Grammar) exploit mainly the similarity between active and passive constructions while having little to say about the differences. Moreover, the correspondence is not stated in terms of a shared argument structure, but is carried over to the configurational structure. In both analyses the passive construction is base generated as [_{VP} PASS V NP], where part of this configuration (the [V NP]) is configurationally and linearly identical to the active VP. In other words, the underlying structure of the passive construction copies the structural relationship which holds between a verb and its direct object in an active construction. This amounts to deriving passives from active constructions, which although has the advantage of capturing the similarities between the two, nevertheless has the drawback of forcing one to resort to additional mechanisms to characterise the differences. By contrast, stating the similarity between actives and passives solely in terms of their shared argument structure without carrying the similarity over to structural properties enables one to characterise the differences as well.

More recent analyses within GB (Baker 1988, Baker, Johnson and Roberts 1989) are indicative of a move towards relaxing the link between passives and their active counterparts, by attributing more content to the passive morpheme. In Baker (1988) the

passive is generated (roughly) under the specifier of IP as the recipient of the external theta role of the verb, and is assumed to have the status of an argument itself. (In fact due to concerns of a general theoretical nature it has to be base generated under I).⁶ The verb then incorporates into INFL to form the passive complex verb.

To account for the differences as to why some languages allow intransitive verbs to passivise, Baker, Johnson and Roberts (1989) suggest that the categorial status of PASS should be parameterised. They claim that the passive in languages like Lithuanian and Turkish is an N which can be base generated in any NP position, including VP internal positions and cliticising to INFL. So the analysis of a VP internal PASS takes the following steps: PASS moves from the VP internal position to the subject position and from there it incorporates into I. This incorporated structure then cliticises to V. In effect, the PASS ends up close to where it started out, in order to satisfy the requirements of different levels. An undesirable aspect of this analysis is that parameterising the categorial status of the passive follows from theory internal considerations only, lacking the generalisations a parametric approach sets to capture.

There are also Case Theory considerations which turn out to be problematic for reasons similar to those outlined in section 2.3. In order to account for case-theoretic variations, Baker, Johnson and Roberts (1989) propose an analysis which is based on visibility setting. This states that an argument is visible for Θ -role assignment at LF if either a) it is assigned case, or b) its head is incorporated into another head. The variation among languages is a result of which of these a language selects as an option; a language might select only (a), it might select either (a) or (b), or it might select (a) if it is structurally possible, but otherwise (b). But there is a contradiction between the second and third options. Why would one language select case-marking for LF visibility *if this is possible* whereas another one overlooks this seemingly significant factor and just freely selects between case-marking for LF visibility or head incorporation? Where are such distinctions encoded? As for the general criticism of Incorporation and Case

Theory, I refer the reader to the relevant sections in Chapters I and II.

Another way in which the passive has been analysed is by assigning the properties of the passive to the lexicon. In Montague grammar the passive morpheme has properties which allows it to join combinatorially with the verb. Such a move, which is generally employed in semantics was evaluated in terms of its application to the Turkish passive in Chapter II. Similarly in Lexical Functional Grammar (Bresnan 1982, Bresnan and Kanerva 1989) passivisation is a lexical rule. The difference between a Montague style analysis and a lexical analysis such as LFG lies both in the underlying assumptions of these models in general, and more specifically in the power attributed to passivisation. In the earlier analyses of LFG, passivisation is a rule which deletes a subject and reintroduces it via stipulating a *by*-phrase, and which turns a subject into an object. Such a rule is too powerful, and is also empirically inadequate because it does not cover the passives of intransitives. The lexical specification also includes a correspondence between thematic roles and grammatical functions which, again, attributes too much power to the lexical specification. In later developments within LFG (Bresnan and Kanerva 1989, Bresnan and Moshi 1990) the correspondence between thematic roles and grammatical functions is redefined in terms of two features: +/-thematic restricted and +/-objective, these yielding four groups. Thematic roles have a central position in the model. The lexical frame of a passive, for instance, not only has to have the thematic roles available for passivisation but their correspondence with specific grammatical functions also has to be stated. Moreover, the lexical entry of verbs includes thematic roles. All of these factors contribute to a theory which is too powerful.

What we have tried to show in this section is that there is a general potential in languages for argument suppression. The theories we have discussed so far do not seem to capture this generalisation in a unified way. In what follows we shall draw on the concept of argument absorption as the basis for passivisation of transitive and

intransitive verbs, as well as for reflexivisation.

5.32 The representation of passivisation

In view of the discussion above, we shall confine our analysis to the passivisation process as it takes place in Turkish. The properties of passive constructions are summarised above in section 5.11 and 5.121. Our starting point will be the familiar assumption that passives correspond to their non-passive counterparts in terms of having the same argument structure; only the passive involves some operation on the argument structure of a verb.

In LDS there are ways of encoding this observation directly as a lexical instruction on manipulating the way in which premises combine in a sequence of steps of Modus Ponens. The premises in question are the arguments in the argument structure of the verb. We shall take the contribution of the passive and reflexive morphemes to be their specification to operate on an argument by assigning it the properties of a dependent variable. In other words, both the passive and reflexive morphemes will force one of the arguments to be interpreted as a variable which will necessarily depend on some other element for its interpretation. This we take to be the content of "argument suppression". The presence of either one of these morphemes bars the independent reference of an argument and forces its construal as a dependent element. The difference between the passive and the reflexive would then merely be a difference of which argument is chosen to be so identified. In the case of the passive it is the last argument in a chain of arguments, and in the case of the reflexive it is the first one, this being transparently stated in the type specifications.⁷

Such an approach makes it considerably simpler to capture one of the main, yet more subtle, characteristics of passivisation; namely, its existential status. Consider a straightforward passive construction such as 'John was beaten'. Such a proposition necessarily encodes an existential generalisation: there was an *x* such that *x* beat John.

The construal of that variable as a dependent element, which we take to be encoded in the passive morpheme itself, captures the existential flavour directly. In this system, existential generalisations can be stated in terms of dependencies which do not involve quantification. This mechanism is called skolemisation, and below we shall give a brief exposition of what this process involves.

Skolemisation is a way of rendering dependency relations explicit. A sentence such as:

(17) Everyone read a paper.

has two interpretations which are standardly characterised as follows:

- (18) a. $\forall x \exists y R(x,y)$
b. $\exists y \forall x R(x,y)$

The first interpretation, the "narrow scope" interpretation of the existential quantifier, is that for everyone, there is a paper such that person read that paper. The other interpretation is the "wide scope" interpretation which induces a reading in which there is certain a paper such that everyone read that paper. The difference between the two representations is characterised solely by the linear ordering of the two quantifiers in the logic. However, linearity is not a logically transparent device. Skolemisation, on the other hand is a device which makes it possible to state this difference without recourse to a somewhat opaque characterisation such as the one given above. A skolem constant characterises an argument as an obligatorily dependent element, hence obviating the need to state the dependency between the quantifiers in a linear fashion. In other words, it captures the dependency relation by stating one argument *in terms of the other argument*. The narrow scope interpretation given in (18a) can be written as:

(19) $\forall x R(x, g(x))$

which means that there is function g , which for x (x ranging over persons) maps x (persons) onto an entity with which this x has the relation R (reading). Hence for all individuals x , there is a mapping from that individual onto another individual defined in terms of x (i.e. a paper for each x) such that there is a relation of reading between them.

Apart from making the semantics explicit, skolemisation has the further advantage of making it possible for the skolemised entity to be dependent not only on an argument but any element which is represented as a label. For example, as we are representing tense as a metabox label, a skolem constant can characterise a dependency relation between arguments and temporal specification. To give an example, the (b) example above can be represented in this fashion. The wide scope interpretation of the existential quantifier can be specified as the indefinite noun phrase being dependent on the temporal specification itself, hence $g(s_a)$:

$$(20) \quad s_a : \forall x R(x, g(s_a))$$

This means that there is a time s_a such that for every person x , and a mapping from that point in time onto that individual x , the relation of reading holds. In other words the relation of reading took place for each individual at the point in time specified by the temporal element, this being true if and only if there is a single event. The indefinite, then, is stated in terms of the mapping from a point in time onto a person. Now we shall look at how this mechanism can help characterise the passive interpretation.

Let us assume, in line with what we have suggested above, that the passive affix in Turkish does not induce a premise in its own right but instead provides an instruction in the form of a control specification stating how the proof is to be built. Whatever the specification, it should be explicit enough to make reference to the argument structure of the root verb. So suppose we assign it the specification:

- (21) *-il*: IDENTIFY LAST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS
VARIABLE SUBJECT TO MOST LOCAL DISCHARGE

This would mean that the last argument present in the argument structure of the root verb would have to be identified with the most local element in the metabox. The concept of locality here can be defined as follows: for any sequence $\langle x_1, \dots, x_n, s_j \rangle$, where x_i labels type e , i.e. is an argument and s_j is a metabox label, and for any $x_i: e$, $x_i: e$ is most local to $x_j: e$ if $j > i$, and there is no k such that $j > k > i$. This means that in an ordered sequence of arguments and metabox labels, the most local element in the labelling algebra is the one immediately following it in the sequence. To exemplify, let us first take the passive of a two-place predicate:

- (22) Kapı aç-ıl-dı.
door open-PASS-PAST
The door was opened.

The representation for this sentence is given below:

(22')

		S_a	GOAL: $w_1:x, w_2:y, \dots w_n:z \vdash f(w_1 \dots w_n) : t$
kapı	1.	kapı' : e	ASSUMPTION, USE LAST
aç	2.	$\lambda x \lambda y [aç(x)(y)] : e \rightarrow (e \rightarrow t)$	ASSUMPTION
-ıl	3.		IDENTIFY LAST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS VARIABLE SUBJECT TO MOST LOCAL DISCHARGE
	4.	CHOOSE $y = g(s_a)$ $\lambda x [aç(x)(g(s_a))] : e \rightarrow t$	MP 2,3
	5.	$aç(kapı)(g(s_a)) : t$	MP 1,4
-dı	6.	CHOOSE $s_a = s_j, s_j < s_{utt}$ $s_j : aç(kapı)(g(s_a)) : t$ $s_j < s_{utt}$	

In line 1 the label for *kapı* 'door' appears as the first premise, an NP which is to be identified as a fixed individual. The lack of overt case marking signals that it is nominative, hence the last to combine. In line 2 the predicate is introduced. As the nominative states the argument in the first line to be the last one to combine, and since there are two arguments in the argument structure of the predicate, this combination cannot take place until the proof proceeds further. When the passive is introduced in line 3, it comes with the specification that the last argument is a dependent variable. We are therefore forced by the encoded properties of the passive to identify (y) as a variable which is dependent on the most local element. It seems at first that there might be choice as to how this variable is to be identified: it can either pick out its reference from the other argument (which is *kapı* 'door') or it can be assigned a value dependent on another label, such as tense. According to our definition of locality, this element is the metabox label. We therefore identify the external argument of the verb directly with the metabox label in line 5. In line 5, we combine the remaining argument in line 1 to get to a t.

Notice that in the proof above, there are two referrals to "last argument". One of these is the specification of the nominative case requiring that its adjacent argument is to be the last to combine, and the other is encoded in the specification of the passive which requires that the last argument is to be identified as a variable. This might seem to be an inconsistency at first, but a closer consideration of the procedural mode of characterisation shows that it is not so. What the passive refers to is the last argument in the argument structure of the verb. What the nominative case refers to is the last premise in a proof. Therefore the nominative cannot fulfil the requirements of its specification until all other information involving the combination of other arguments take place. It naturally follows then, that the identification of the variable is to take place. So under no circumstances can the variable referred to by the specification of the passive, and the argument referred to by the specification of the nominative be the same element.

We next turn to the passive of a one-place predicate and its representation. It was mentioned above that the understood logical subject in such constructions were construed as being human, repeated below:

- (23) a. İnsanlar/kediler bahçe-ye çık-tı.
 people/cats garden-DAT go out-PAST
 The people/cats went out into the garden.
- b. Bahçe-ye çık-ıl-dı.
 garden-DAT go out-PASS-PAST
 (one, some people)/(?the cats) went out into the garden.
- (24) a. İnsanlar/kitaplar yer-e düş-tü.
 people/books floor-DAT fall-PAST
 The people/books fell on the floor.
- b. Yer-e düş-ül-dü.
 floor-DAT fall-PASS-PAST
 (One)/(?the books) fell on the floor.

Although the non-passive sentences in (23a) and (24a) are neutral with respect to whether the subject has human characteristics or not, the passivised verbal complex illustrated in the (b) examples induces a constraint whereby the logical subject must be construed as having human characteristics.⁸ We can characterise this property directly as a specification encoded in the representation of the passive suffix. What we have to decide on is whether it would be preferable to state it as a filter on the output, or as a filter on the combinatorial process itself. The implications of these two would be quite different. If one were to specify the human restriction as a filter on the output, the combinatorial process would take place irrespective of this factor and the output would

simply be interpreted as having an implicit human agent. If, on the other hand, the combinatorial process itself were to be jeopardised because of a mismatch ensuing from a selectional restriction, then intransitive verbs with non-human agents would not be allowed to passivise. The first option seems to be the better solution given that such constructions are interpreted metaphorically. We characterise this filter as **HOLD $V(x) : t$ IFF HUMAN (x)** .⁹

- (25) Düş-ül-dü.
 fall-PASS-PAST
 There was a falling.

(25')

		s_a	GOAL: $w_1:x, w_2:y, \dots w_n:z \vdash f(w_1 \dots w_n) : t$	
düş	1.	$\lambda x [\text{düş}'(x)] : e \rightarrow t$	ASSUMPTION	
-ül	2.		IDENTIFY LAST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS VARIABLE SUBJECT TO MOST LOCAL DISCHARGE HOLD $V(x) : t$ IFF HUMAN (x)	OF
	3.	CHOOSE $u = g(s_a)$ $\text{düş}'(g(s_a)) : t$	MP 1,3	
-dü	4.	CHOOSE $s_a = s_j \quad s_j < s_{utt}$ $s_j : \text{düş}'(g(s_a)) : t$ $s_j < s_{utt}$		

The proof proceeds as before. The only difference here is the specification of the passive regarding the human construal of the logical subject. The passive suffix, then, has the following specification:

- (26) -il: IDENTIFY LAST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS
 VARIABLE SUBJECT TO MOST LOCAL DISCHARGE
HOLD $V(x) : t$ iff HUMAN (x)

As pointed out before, the construal of the implicit agent as human is confined to passivised one-place predicates. That is, only when the passive applies to the logical type $e \rightarrow t$ does this specification hold. This additional lexical specification explains why constructions requiring human agency cannot passivise. An alternative proposal is made by Özkaragöz (1986b) who attributes the ungrammaticality of sentences such as

- (27) *Burada kana-n-dı.
 here bleed-PASS-PAST
 Intended interpretation: Here it was bled.

to the presence of unaccusative verbs in Turkish. *kana* 'bleed' which she analyses as unaccusative has the external argument generated in the direct object position. The verb which is unable to assign it accusative case marking initiates the movement process which takes the direct object to the subject position. The reason why such constructions cannot be passivised is attributed to the presence of the 1 Advancement Exclusiveness hypothesis which bars the movement of the same element more than once. However, in our analysis, we can account for the ungrammaticality of such constructions directly without invoking an additional class of verbs, or resorting to additional mechanisms. The analysis also explains why similar verbs enforce different interpretations. In double occurrences of the passive (to be analysed in section 5.2211) it is only the human restrictions which makes the sequence **giy-il-in-ir* 'wear-PASS-PASS-AOR' ill-formed, despite the fact that the verb *giy* is transitive. The second occurrence of the passive, which, in effect operates on a one-place predicate can only be interpreted if the remaining argument is human, which in the case of *giy-il* 'worn' is not.

It was mentioned above that although both are derivational morphemes, the causative and passive differed with respect to the nature of their specification. The causative morpheme has a logical type specification which contains declarative information similar to that in content words, whereas the passive suffix encodes a

control specification which imposes conditions on how a proof is to proceed. This distinction has consequences which are significant for the way a proof is built. A crucial difference is that lexical items with declarative content merely seek a type which is suitable for their combination. A causative, for example, only requires the presence of an element of the logical type *t*. But items carrying procedural information, such as passive, have the ability to interact with elements at different steps of the proof. This issue will be taken up again in section 6.21.

5.321 Double Passives

There are certain constructions in Turkish which have double passive morphology. Double passives are found in three distinct construction types:

- A. On a single verbal complex with intervening modal:
[V-PASS-MOD-PASS]
- B. On a single verbal complex:
[V-PASS-PASS]
- C. On two separate verbs in a clause:
[NP V-PASS-INFT V-PASS-TNS-AGR]

The first type of double occurrence of the passive morpheme in colloquial Turkish involves the vacuous application of one of the instantiations of the passive suffix. In a construction such as

- (28) *Böyle bir adam döv-ül-ebil-in-ir.*
such a man beat-PASS-MOD-PASS-AOR
Such a man can be beaten.

only one of the passive morphemes here has its logical properties fulfilled, with the second instantiation used for stylistic purposes inducing an emphatic-reiterative interpretation.¹⁰

The fact that one of the applications of the passive here is logically vacuous clashes with claims that there are no vacuous morphemes (Kornfilt 1984b, Marantz 1984). One could argue against these claims in two ways. The weaker position is that morphemes may apply vacuously if this term only covers information relating to configurational or syntactic information but not to other types of information relating to the interpretation of an utterance. Adopting this position, we could claim that the second occurrence of the passive morpheme is vacuous in the sense that its configurational properties are barred from being implemented, but not vacuous because it induces pragmatic effects such as emphasis. However, there is another "stronger" position whereby we can claim that languages do have true redundancy, and the vacuous application of some elements needs to be incorporated into theories, a point which falls within the broader remit of information theories. What interests us here is that the second occurrence of the passive in such constructions applies vacuously from a configurational point of view, and we shall have to look at what bars it from being interpreted.

In principle, there should be no reason why the second occurrence of the passive does not receive an interpretation. In fact, if the sequence of the verbal complex were to be *V-PASS-PASS-MOD* instead of what we have here which is *V-PASS-MOD-PASS*, then the second passive could not apply vacuously. It seems then that the intervening modal somehow bars the application of the passive. We cannot say at this stage exactly how this happens and we shall leave this topic for further investigation.

The other two instantiations of double passive morphology have configurational consequences which we shall investigate below.

5.3211 Monoclausal double passives

Özkaragöz (1986a) notes the following marginal use of the double occurrence of the passive morpheme:

- (29) a. Bu şato-da bog-**ul-un**-ur.
 this chateau-LOC strangle-PASS-PASS-AOR
 One is strangled (by one) in this chateau.

- b. Bu oda-da döv-**ül-ün**-ür.
 this room-LOC beat-PASS-PASS-AOR
 One is beaten (by one) in this room.

It should be remembered that such constructions constituted the main evidence against a logical type specification for the passive morpheme, as outlined in section 2.2365. Here we shall see that shifting from a declarative content to a procedural specification proves to be advantageous from another point of view as well. The double occurrence of passive morphology on the verbal complex has to occur with the aorist suffix, in other words, double passive morphology induces a generic reading. The procedural mode of analysing the passive suffix directly explains why this should be so. Also, the procedural specification we assign to the passive accounts for why it is only two-place predicates which can host the double occurrence of passivisation.

The proof for (29b) is given below. I have left out the adverb altogether since the contribution of locative adverbs to proofs is irrelevant here.

(29b')

		s_a	GOAL: $w_1:x, w_2:y, \dots w_n:z \vdash f(w_1 \dots w_n) : t$	
döv	1.	$\lambda x \lambda y [döv' (x)(y)] : e \rightarrow (e \rightarrow t)$	ASSUMPTION	
-ül	2.		IDENTIFY LAST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS VARIABLE SUBJECT TO MOST LOCAL DISCHARGE HOLD $V'(x) : t$ IFF HUMAN (x)	OF
	3.	CHOOSE $y = g(s_a)$ $\lambda x döv' (x)(g(s_a)) : e \rightarrow t$		
-ün	4.		IDENTIFY LAST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS VARIABLE SUBJECT TO MOST LOCAL DISCHARGE HOLD $V'(x) : t$ IFF HUMAN (x)	OF
	5.	CHOOSE $x = f(s_a)$ $döv' (f(s_a)) (g(s_a)) : t$		
-ür	6.	CHOOSE $s_a = s_j, s_j$ accessible to s_{utt} $s_j : döv' (f(s_a)) (g(s_a)) : t$ s_j accessible to s_{utt}		

Let us explain how the proof proceeds. The first step introduces the first premise which is a two-place predicate. The first instantiation of the passive morpheme in line 2 gives an instruction as to how to identify the last argument in the argument structure of the verb. The last argument is represented as the variable y , so it is y that is chosen as the argument which is to be identified as the variable in line 3. We therefore have to find a value for the variable. Since the only value provided in the string is the label of the metabox itself, this is the value we have to choose for it in line 3, which gives us $döv' (x)(g(s_a)) : e \rightarrow t$. Let us try to see what this indicates. The left hand side of the labelled formula encodes the history of the application of all the specifications and steps: a two-place predicate whose "external" argument slot has been provided with a value, namely a skolem constant $g(s_a)$. This says that there is fixed function g which maps the metabox label (which is a temporal/aspectual specification) onto an individual such that at that time and for that individual the relation of hitting holds. (So at time s_a a hit x , b hit x , c hit x , and so on). Hitting here is taken as a relation because of the dependent

nature of the skolem constant. The right hand side of the formula indicates that as a result of providing a value for the variable, the output category is $e \rightarrow t$, a one-place predicate.

In line 4 the second passive morpheme is introduced. Again we are to identify the last argument as a variable and the only argument left is the variable x in the argument structure of the verb. When seeking a value for this variable, we have several options: we can either assign the value $g(s_a)$ to this variable as well, or we can assign it a value which employs another function, say, $f(s_a)$. Either way, one will have replaced the object of hitting by a function which is itself dependent on something else. The first option will yield the formula $d\ddot{o}v'(g(s_a))(g(s_a)) : e \rightarrow t$. This says that there is a fixed function g which maps the metabox label (the same temporal/aspectual specification as before) onto an individual which is itself a mapping from a temporal specification onto an individual. But we do not have an individual variable which we can form a relation with. Therefore what we automatically get is 'a hitting'. But there is the possibility of ambiguity which we wish to avoid. The characterisation $d\ddot{o}v'(g(s_a))(g(s_a)) : e \rightarrow t$ does not exclude 'a hitting of oneself', the reflexive interpretation. Instead, if we use a different skolem function ($f(s_a)$), then there will be no such ambiguity. Hence the characterisation of double passivisation as $d\ddot{o}v'(f(s_a))(g(s_a)) : t$. As for the generic interpretation, we take this to be a consequence of an action for which neither the agent nor the recipient is specified. There is no reason to attribute the genericity of monoclausal double passives to a grammatical factor. In other words, the reason why native speakers consider the aorist a better choice for temporal specification than a past or future tense is not a grammatical property but a functional one.

5.3212 Infinitival double passives

In this section we shall turn our attention to the third type of double passivisation, constructions with embedded infinitivals, first observed by Kornfilt (1988). We should like to point out that the data on these constructions is fuzzy, with native speakers' grammaticality judgements varying even for a single speaker on different occasions.

This might be due to the fact that such constructions are far less common in everyday language than in written (broadcast) texts, where they have almost become the standard form of reporting events with vague agents. One consequence of this is that in such texts, the matrix verbs of these constructions are exclusively in the third person, which due to its unmarked nature makes it impossible to understand what the subject is (because there is more than one contender). The first and second persons on the other hand could, in principle, supply the necessary information, but this time the grammaticality judgements differ vastly because such sentences are not common. However, it is crucial to understand what the subject is in order to provide an account for infinitival double passives and as it stands, the tests give conflicting results. Considering that the fuzziness of the data fails to provide a basis on which a full analysis can be made, I shall limit myself to highlighting certain peculiarities in these constructions which resist an analysis, rather than providing a full account of their structure.

Kornfilt (1988) discusses the following data:

- (30) a. Üniversiteler kuşat-ıl-mak iste-n-di.
 universities surround-PASS-INFN want-PASS-PAST
 The universities were wanted to be surrounded.
- b. Üniversiteler kuşat-ıl-mag-a başla-n-dı.
 universities surround-PASS-INFN-DAT begin-PASS-PAST
 The universities were started to be surrounded.
- c. Üniversiteler kuşat-ıl-maga çalış-ıl-dı.
 universities surround-PASS-INFN-DAT try-PASS-PAST
 The universities were tried to be surrounded.

In these constructions, both the matrix verb and the embedded verb have passive morphology. As Kornfilt points out, the peculiarity of these constructions is their apparent similarity with ECM constructions (in English), despite the fact that the matrix verbs in these sentences are control verbs. An ECM verb such as *expect* yields a double passive construction if the embedded clause is also a passive:

(31) John was expected to be given a medal.

It is also possible to have two *by*-phrases in such constructions with disjoint reference, indicating that there are two separate instantiations of the passive. As pointed out by Kornfilt, the matrix verbs in (30) are not ECM verbs. In ECM verbs in Turkish the external argument of the embedded verb has accusative case marking as in (32a) which is not the case in the constructions under investigation:

(32) a. John sen-i gel-di sanıyor. (ECM verb)
 you-ACC arrive-PAST thinks
 John thinks you have arrived.

b. *John sen-i gel-di istiyor. (Non-ECM verb)
 you-ACC arrive-PAST wants.
 John wants you to arrive.

Another indication that the matrix verbs in (30) are not ECM verbs is the impossibility of having disjoint agent phrases in these constructions. When an agent phrase is present, it is necessarily construed as the logical subject of both verbs in the construction.

Kornfilt argues that the matrix verbs in these constructions are control verbs which trigger NP deletion. In her analysis the surface subject, which will hitherto be referred to as NP_{NOM} (*üniversiteler* in (30)) is base-generated in the direct object position

of the embedded verb. It first moves to the subject position of the embedded verb and then to the subject position of the matrix verb:

- (33) Üniversiteler_i [_{NP} t_i [_{VP} t_i kuşat-ıl-mak]] iste-n-di.
 universities surround-PASS-INFN want-PASS-PAST
 The universities were wanted to be surrounded.

Within the network of GB assumptions, the motivation for the initial movement is forced by the inability of the embedded (infinitival) verb to assign case (because it is passive). However its intermediate landing site, the subject position of the embedded clause, also lacks case because the clause does not contain a case assigner (INFL or, according to George and Kornfilt (1981), AGR). It therefore moves to the subject position of the matrix clause where it receives case from the case assigner of this clause. But this time, because of the presence of NP which is a barrier to government, the intermediate trace cannot be properly governed and an ECP violation occurs. However, since the construction is grammatical, there must be another factor which guarantees that there is no such violation. Kornfilt suggests that this factor is NP deletion triggered by the presence of the control verbs. In other words, control verbs in Turkish have the lexical property of inducing NP deletion, and the offending trace in these constructions thus cease to be ECP violations, the result being well-formed constructions.

This analysis raises a number of questions. First of all the operational capacity of NP deletion upon which the analysis hinges seems to be inadequately described. Processes of deletion are required for the ECP, and they are mechanisms which permit government across boundaries which would otherwise bar it. An important aspect of deletion is that whatever occurs under the deleted projection is actually barred from being overtly expressed. Deletion is not simply the crossing out of a node, and one of its empirical consequences is that whatever the deleted node hosts has to be deleted. This is what happens with S' deletion (Lasnik and Uriagereka 1988, Rizzi 1990) where

the complementiser is deleted. In fact it is specifically argued in these works that words with lexical content cannot be deleted, otherwise the grammar would grossly overgenerate. But NP deletion as described in the analysis above does not have such an effect in Turkish. That is, no element under this maximal projection gets barred from being overtly expressed, which should be the case if there were such a mechanism. In fact, Kornfilt herself treats the infinitival as a head and in effect, the construction contains a lexically expressed head with no maximal projection. This forces one to question what it is that gets deleted when NP deletion takes place. As far as one can tell from the examples, it is only the node but not the content of the node that gets deleted, weakening the function of this mechanism considerably.

Next we turn to the status of the embedded infinitival with a view to understanding its relation to the matrix verb. Kornfilt assumes that the infinitival constituent is an NP, which we agree with. Infinitivals in Turkish behave like NPs with respect to case and possessive marking. In the case of intransitive matrix verbs such as *başla* 'start' and *çalış* 'try', the embedded infinitival construction is an adverb because just like most adverbs in Turkish it is case marked (dative), and the case marker is blind to the effect of passivisation. In other words, the infinitival retains its case when the matrix verb is passivised. In the case of *iste* 'want', however, the embedded infinitival construction clearly behaves like a direct object complement, hence an argument. Consider (34a) and (34b). Active clauses with *iste* 'want' contain infinitivals (underlined in (34b)) in the same position one would expect to find an ordinary NP direct object argument (it should be remembered that the marker for accusative is either a case suffix or the preverbal position, both of which are illustrated below):

- (34) a. Ben pasta/pasta-yı istiyorum.
 I cake/cake-ACC want.
 I want a cake.

- b. Ben okumak/okuma-yı istiyorum.
 I to read/to read-ACC want.
 I want to read.

The question then is, being an NP, how does an infinitival get its case when it is the embedded clause of *iste* 'want' as in (33)? It cannot receive objective case from the matrix verb or any inflectional element hosted there, because the matrix verb has passive morphology which suppresses accusative case marking. It cannot receive nominative case from the matrix verb because whatever case there is, it is assigned to NP_{NOM}, *üniversiteler*, which Kornfilt assumes is the surface subject. Therefore the infinitival NP *kuşatılmak* 'to be surrounded' in (33) is left without case and should violate the visibility condition.

Another point of interest is the status of passive morphology in the matrix verb. The function of the passive on the infinitival is clear. It is the initiator of movement because it suppresses case from being assigned to the embedded object *üniversiteler*. But what does passive morphology suppress when it is attached to the matrix verb? Kornfilt argues that its function is to suppress the assignment of the Θ -role of the matrix verb, which would otherwise be assigned to the subject (*üniversiteler*). Otherwise a Θ -criterion violation would occur because this constituent already has a Θ -role assigned to it by virtue of its role as the object of the embedded infinitival. But what about constructions lacking passive morphology on the matrix verb, which nevertheless have embedded infinitivals with passive morphology? The constructions below illustrate this:

- (35) a. Üniversiteler kuşat-ıl-mak ist-iyor.
 universities surround-PASS-INFN want-ASP
 The universities need to be surrounded.

- b. Üniversiteler kuşat-ıl-mag-a başla-dı.
 universities surround-PASS-INFN-DAT begin-PAST
 The universities started to be surrounded.

According to the analysis given above, the lack of passive morphology on the matrix verb should create a Θ -criterion violation, because it was precisely this that stopped the subject from having two Θ -roles. The explanation Kornfilt provides is that the matrix verbs *başla* and *iste* have two separate lexical entries, one as control verbs (as in (28) above) and the other as raising verbs (as in (35)) which do not have an external Θ -role to assign. In other words, the matrix verbs in (33) and (35a) have different lexical specifications. By claim, control verbs can induce both an "event" reading and an "action" reading depending on the whether the embedded infinitival permits such a reading, as in (36a) and (37a). Raising verbs, on the other hand, lack an external Θ -role, hence they lack an instigator of the action. Therefore they can only induce an "event" reading as in (36b):

- (36) a. Kapı çal-ın-ma-ga başla-n-dı. (Action reading)
 door ring-PASS-INFN-DAT start-PASS-PAST
 The door was started to be rung.
- b. Kapı çal-ın-ma-ga başla-dı. (Event reading)
 door ring-PASS-INFN-DAT start-PAST
 The door started to be rung.
- (37) a. Kapı boya-n-ma-ga başla-n-dı. (Action Reading)
 door paint-PASS-INFN-DAT start-PASS-PAST
 The door was started to be painted.

b. *Kapı	boya-n-ma-ga	başla-dı.	(Event Reading)
door	paint-PASS-INFN-DAT	start-PAST	
The door started to be painted.			

The important example is, of course, the ungrammatical (37b). Kornfilt uses this example as an indication that *başla* is lexically listed as a raising verb as well. This is why it cannot have 'paint', a verb which requires an instigator, in an embedded construction. Therefore the event reading induced by the raising verb *başla* creates a clash with the embedded verb which forces the presence of an instigator. The fact that a similar construction such as (36b) allows an event reading is attributed to the difference between the meaning of the infinitivals: 'knock' may be thought of as not requiring an instigator, whereas 'paint' always requires one. More specifically, Kornfilt claims that (36b) can be interpreted as 'there is a knocking on the door' without there necessarily being an instigator, but argues that the same cannot be said of (37b): that there cannot be a painting of the door without one noticing, or being aware of, an instigator.

But this is not altogether correct. Apart from the very obvious metaphoric reading where one can imagine "a painting of the door" just as one can imagine "a knocking of the door", there is also an interpretation whereby each instantiation of the painting of the door can have happened at intervals. In such a reading one might very well refer to a situation where the instigator is not noticed, but the gradual painting of the door is. We therefore assume that the distinction between the event and action readings is not well-defined, that even though there may be an event reading, it does not necessarily follow from this that there is no instigator, only that the instigator is not prominent, due to pragmatic factors. This, however, does not lead to an ungrammaticality effect as indicated by the star in front of (37b). In fact, grammaticality judgements concerning (37b) are contaminated by the fact that this very sentence can also be interpreted as a reflexive, due to the homophony of the one of the variants of

the passive and reflexive morphemes. It can therefore mean ‘The door painted itself’ which is, of course, semantically ill-formed, hence judged as unacceptable by native speakers. Replacing the embedded infinitival *boya-n* ‘be painted/ paint self’ with a verb which requires an instigator, *and* unambiguously uses a passive suffix might shed light on the behaviour of this verb. This way we can test whether there is indeed a raising verb *başla*. If there is, it would induce an event reading. Since an event reading lacks an instigator (hence an external Θ -role) it should not be used with an embedded infinitival which requires one. So let us use the verb *yont* ‘grind’ which requires an instigator, and which takes a passive suffix which cannot be confused with a reflexive:

- (38) Kapi yont-ul-mag-a başla-dı.
 door grind-PASS-INFN-DAT start-PAST
 The door started to be ground.

There is no question as to the grammaticality of this sentence. From this we conclude that there is no reason to assume that (36b) and (37b) are different in terms of the availability of an event reading. Hence, it does not follow that *başla* has two separate lexical specifications, one with an external Θ -role to assign and one without. We assume that these verbs have single lexical representations and the presence or absence of the passive morpheme has nothing to do with considerations regarding the external Θ -role. Rather, we shall suggest as an alternative analysis that the presence or absence of the passive morphology on the matrix verb induces two separate configurations which follow from a single lexical specification (to be represented shortly in (40a’) and (41a’).

Another objection to Kornfilt’s analysis is the following. If the matrix verb (or any inflectional element hosted there) has the capacity to assign case, and supposing that its receptor is NP_{NOM} in the above examples, what is the receptor of case when the embedded infinitival is a one-place predicate? Consider the following:

- (39) Hergün pikni-ge gid-il-mek iste-n-iyor.
 everyday picnic-DAT go-PASS-INFN want-PASS-ASP
 Everyday (one) wants to go on a picnic.

Due to the presence of a one-place predicate, there can be no NP movement in the infinitival clause because there is no NP here, and therefore, there can be no element which receives nominative case, assuming that this case is assigned by features on the matrix verb.

I shall not be aiming at a full solution for these constructions as I mentioned above. But an alternative view would be one in which the embedded complement *üniversiteler* is not the subject of double passive constructions. We shall first look at the data from a general theoretical point of view. Suppose that in the case of *iste* 'want' the surface subject is the whole infinitival clause, and in the case of *başla* 'start' and *çalış* 'try', the constructions lack a subject because these matrix verbs are one-place predicates. The advantage of this position lies in its relative simplicity: this way one would not require additional means such as NP deletion which we argued was undesirable for theory internal reasons, we avoid Case Theory inconsistencies mentioned above, we do not need two separate lexical entries for a single verb such as *başla* 'start' and we do not have to explain why "suppression" mechanisms associated with the passive suffix are operational in its absence too. Let us look at the sentences again:

- (40) a. Üniversiteler kuşat-il-mak iste-n-di.
 universities surround-PASS-INFN want-PASS-PAST
 The universities were wanted to be surrounded.
- b. Üniversiteler kuşat-il-mag-a başla-n-dı.
 universities surround-PASS-INFN-DAT begin-PASS-PAST
 The universities were started to be surrounded.

- c. Üniversiteler kuşat-ıl-maga çalış-ıl-dı.
 universities surround-PASS-INFN-DAT try-PASS-PAST
 The universities were tried to be surrounded.

And in addition, there are sentences which do not have passive morphology on the matrix verb:

- (41) a. Üniversiteler kuşat-ıl-mak ist-iyor.
 universities surround-PASS-INFN want-PROG
 The universities wanted to be surrounded.¹¹
- b. Üniversiteler kuşat-ıl-mag-a başla-dı.
 universities surround-PASS-INFN-DAT begin-PASS-PAST
 The universities started to be surrounded.
- c. *Üniversiteler kuşat-ıl-maga çalış-tı.
 universities surround-PASS-INFN-DAT try-PASS-PAST
 The universities were tried to be surrounded.

Suppose the difference between (40a) and (40b) on the one hand, and (41a) and (41b) on the other comes from configuration differences. (40a), which has a two-place predicate as the matrix verb, has a subject, and the subject is the embedded infinitival clause. (40b), which has a passivised one-place predicate does not have a subject, and the embedded infinitival is an adjunct, as its dative case marking shows. In (41a), the matrix verb lacks passive morphology, hence, this is not a passive clause. The subject is *üniversiteler*, and the infinitival verb is just like ordinary infinitivals in control constructions. The same is true for (41b). These observations are totally consistent with what we would expect from control verbs. Below we give a sketch of the constituency relations of the sentences in (40) and (41) as an alternative proposal:

- (40a') [SUBJECT NP INFN-PASS] iste-PASS
 (40b') [ADVERBIAL NP INFN-PASS]-DAT başla-PASS
 (41a') [SUBJECT NP] [DIRECT OBJECT INFN-PASS] iste
 (41b') [SUBJECT NP] [OBLIQUE OBJECT INFN-PASS] başla

These examples show that the structural status of the infinitival and the NP is just as expected. Moreover, they demonstrate that *iste* 'want' and *başla* 'start' do not have selectional constraints regarding their agents: these verbs do not require an animate agent unlike the verb *çalış* 'try' which crucially does not allow an inanimate subject. This is why (41c) is ungrammatical: it has an inanimate agent but a verb which does not allow one.

Now let us turn to the data which questions the subjecthood of NP_{NOM}. In Turkish, the most obvious sign of subjecthood is the subject agreement morpheme on the matrix verb. In all the examples above NP_{NOM} is third person. But crucially, there is no overt marking for third person in Turkish. In principal, then, the verb could be agreeing with *the whole of the infinitival clause*, this being third person as well. One way of testing this suggestion is to replace *üniversiteler* with a first person pronoun which would trigger agreement on the verb if this were indeed the subject. The acceptability of the outcome is questionable with *iste* 'want', but considerably more dubious with *çalış* 'work' and *başla* 'start':

- (42) a. Ben döv-ül-mek iste-n-dı-m.
 I beat-PASS-INFN want-PASS-PAST-1
 I was wanted to be beaten.
- b. ??Ben döv-ül-meg-e başla-n-dı-m.
 I beat-PASS-INFN-DAT start-PASS-PAST-1
 I was started to be beaten.

- c. ??Ben döv-**ül**-meg-e çalış-**ıl**-dı-m.
 I beat-PASS-INFN-DAT try-PASS-PAST-1
 I was tried to be beaten.

And the more complex the construction gets the worse the outcome:

- (43) a. *?Sen kaçtan beri döv-**ül**-meg-e çalış-**ıl**-ıyor-sun?
 You since when beat-PASS-INFN-DAT try-PASS-PAST-2
 Attempted reading: Since when have you been tried to be beaten.
- b. *?Sev-**ıl**-meg-e çalış-**ıl**-ıyor-sun diye bu kadar sevinme.
 love-PASS-INFN-DAT try-PASS-PAST-2 because this much be happy
 -NEG(IMPER)
 Attempted reading: Don't be so happy just because you are tried to be loved.

If this were all the data, we could possibly conclude that the constituency relations given in (40a'-41b') were correct. However, this would then mean that NP_{NOM} would have to be the subject of the infinitival and as a consequence, constructions like the following should be grammatical:

- (44) Ben döv-**ül**-me-ye çalış-**ıl**-dı.
 I beat-PASS-INFN-DAT try-PASS-PAST
 I was tried to be beaten.

That is, the alternative proposal we have sketched out which treats the embedded infinitival as either the subject (in the case of *iste*) and otherwise as an adverbial would predict that constructions like (44) are grammatical, because the first person pronoun *ben*, being internal to the infinitival could not agree with the matrix verb in any case.

But sentences such as (44) are considered to be much worse than those in (42). How can we explain these facts?

One explanation could be the following: bare infinitivals such as the one in (43) cannot have overt subjects, therefore the NP_{NOM} could not be a subject of the lower clause in any case. But we have been arguing that it cannot be the subject of the matrix clause either. So what is it? A possible clue comes from Portuguese. It appears that certain topic constructions in Portuguese have topics which are parsed as subjects of the clause due to the effect of linear factors. Such topics therefore bear the marking which is typical of subjects. It is not surprising for languages to have mechanisms which conflate properties due to non-configurational factors, linearity or otherwise. Turning to the Turkish data, the fact that NP_{NOM} in these constructions does not seem to agree with the matrix subject might be explained in similar lines. It is probably a topic which is parsed as a subject. One would then have to account for why only third person topics are allowed in the language, in view of (44).¹²

We conclude this section by reiterating that a fuller understanding of these constructions requires new data and possibly alternative proposals for the structure of control constructions and infinitivals.

5.322 Implicit arguments

The analysis we have provided for passivisation so far reflects the correspondence between passives and their non-passive counterparts in terms of argument structure. The purpose of this section is to point out one of the asymmetries and at this stage we shall not be able to provide a full explanation for the facts, as this would require a detailed study of the representation of control structures.

The most striking evidence for the non-parallelism between passives and actives presents itself in constructions with understood agents. Consider the familiar case of

sentences such as *The boat was sunk to collect the insurance* (cf. Roeper 1987 and references therein). It is argued that in this and similar sentences, the implicit agentive phrase of the passive clause controls the subject of the purpose clause such that these two are coreferential. That is, this sentence can only mean 'The boat was sunk (by x) (for x) to collect the insurance' but not 'The boat was sunk (by x) (for y) to collect the insurance'. This observation has led researchers to analyse the implicit argument as being syntactically active, in that it can control the subject of the purpose clause (cf. Brody and Manzini 1988).¹³

Let us first turn our attention to claims regarding the coreferentiality of the understood agent of the passive clause and the subject of the purpose clause. A point which needs to be considered is that passive sentences with purpose clauses are not necessarily identical in interpretation to their non-passive counterparts. They are asymmetrical because the coreferentiality between the agent of a non-passive clause and the understood subject of the purpose clause breaks down in passive constructions. Consider first a sentence with a purpose clause:

- (45) [Kraliçe-nin geliř-i-ni kutlamak için] 21 pare top atışı yap-tı-k.
 [queen-GEN coming-POSS-ACC celebrate for] 21 gun salute make-PAST-1pl
 To celebrate the Queen's arrival, we made a 21 gun salute.

In this sentence, the performers of the 21 gun salute and the celebrators denote the same set. In fact, it is always the case that in such clauses the subject of the purpose clause and the subject of the matrix verb are coreferential.

But in sentences with a passive matrix verb, there are three possibilities regarding the relation between the referent of the agent of a passive verb and the subject of the purpose clause: they are either coreferential, or one is a subset of the other, or they are disjoint in reference. The first option holds in sentences which usually have a

passivised intransitive verb as the matrix verb, as in (46b):

- (46) a. Piknig-e [eglenmek için] git-ti-k.
 picnic-DAT to have fun for go-PAST-1pl
 We went on a picnic to have fun.
- b. Piknig-e [eglenmek için] gid-il-di.
 picnic-DAT to have fun for go-PASS-PAST
 (People) went on a picnic to have fun.

In terms of the referentiality relationship, such sentences directly correspond to their non-passive counterparts as in (46a). One important aspect of passivised intransitives is that they do not allow the overt expression of an agent phrase, a point which we shall return to subsequently.

The second option in which the agent of the purpose clause is a member of the set denoted by the agent of the matrix clause is illustrated below:

- (47) [Kraliçe-nin geliş-i-ni kutlamak için] 21 pare top atışı yap-ıl-dı.
 [queen-GEN coming-POSS-ACC celebrate for] 21 gun salute make-PASS-PAST
 To celebrate the Queen's arrival, there was a 21 gun salute.

Here the set of those who perform the 21 gun salute is not necessarily identical to the set denoting those who are celebrating the event, but rather, the former is a subset of the latter. It could be argued that a theory of indexation of coreferentiality need only form a link between two elements without specifying the denotations of the sets. However, the significance of this example is that it highlights an asymmetry between passives and their non-passive counterpart since the latter do not display this property, as was shown in (45) above. The only reading that is available is one where the agents

performing the 21 gun salute and those who are doing the celebration denote the same set.

The last option of disjoint reference presents yet another asymmetry which occurs when the understood agent of the passive clause can denote an altogether different individual or a set of individuals from the subject of the purpose clause:

- (48) a. Muhammed Ali-yi [şampiyon olmak için] yen-di.
 -ACC to be champion for beat-PAST-3

He beat Mohammed Ali to become champion.

- b. Muhammed Ali [şampiyon olmak için] yen-il-di.
 to be champion for beat-PASS-PAST-3

(i) Mohammed Ali was beaten (by x) (for x) to become champion.

(ii) Mohammed Ali was beaten (by x) (for Mohammed Ali) to become champion.

(48b) without pragmatic pressure induces the reading that Mohammed Ali was beaten so that he, Mohammed Ali would become champion rather than 'Mohammed Ali was beaten by x for x to become champion', as one would expect. Such data suggest that in coreference relations the presence of an overt subject, at least in Turkish,¹⁴ can override the fact that there is a syntactically active implicit argument. An implicit argument is more likely to be syntactically active when there is no overt subject. This in turn, suggests that the agent phrase is retrievable, but not necessarily syntactically present. Therefore we cannot speak of an implicit argument controlling the subject of a purpose clause in all circumstances.

These observations, apart from showing a distinction between passives and their non-passive counterparts indicates another interesting aspect of passive constructions.

In Brody and Manzini (1989) only the option whereby the agent in the purpose clause is coreferential with the agent of the passive is mentioned, this being taken as an indication of the syntactic activeness of an element which is not overt. In other words, it is taken as evidence for a syntactically empty element (in the sense described in GB). If we assume that there is a syntactically present empty element, we cannot account for the fact that it sometimes controls the understood agent of the purpose clause (as in (46b)), but at other times it may fail to do so (as in (47) and (48b)). To summarise the facts, let us represent the clauses under scrutiny as follows:

(49) [PURPOSE CLAUSE X.....] Y V

where X is the understood subject of the purpose clause, Y the agent of the matrix verb indicated as V. Y is overt only when V is active, otherwise, it is the implicit subject argument. In active clauses and in passive clauses where V is intransitive, X and Y are coreferential. In passive clauses with transitive V there is a choice as to what the agent of the purpose clause can identify with. It can identify with the internal argument of the matrix verb as in (44bii). The result is 'Mohammed Ali was beaten (by x) (for Mohammed Ali) to become champion. Alternatively it is chosen to identify with the external argument which yields 'Mohammed Ali was beaten (by x) (for x) to become champion'. The reading in (43) is an extension of this latter reading. Finally, the reason why intransitives only have one possible reading is because there is only one argument available for the target of identification, the external, and only argument of the matrix verb (option ii). Whatever choice is made depends further on the compatibility of the choice with the semantic properties of the verbs. In short, it seems that the presence of the passive breaks down control. We leave the analysis of these constructions to further research.¹⁵

5.323 The agent phrase

The agent phrase in Turkish is expressed by means of the complex post-position *tarafından* 'by' which literally means 'from the side of'. *tarafından* is lexically specified for animate objects, ruling out constructions with inanimate agents:

- (50) a. *Çamaşırlar makina tarafından iyi yıka-n-ma-mış.
 laundry machine by well wash-PASS-NEG-PAST-HS
 Intended interpretation: The laundry hasn't been washed well by the washing machine.
- b. *Parmagım makas tarafından acıt-ıl-dı.
 finger-POSS scissors by hurt-PASS-PAST-3
 Intended interpretation: My finger was hurt by the scissors.

The cross-linguistic behaviour of *by*-phrases is quite diverse, ranging from being unavailable even with passivised transitives as in Hindi (Kachru 1976), to co-occurring with passivised intransitives as in Lithuanian and North Russian (Timberlake 1976, 1982):

Lithuanian

- (51) Kur mus gimta ... ?
 Where by-us bear-PASS
 Where were we born?

(From Timberlake 1982)

In Turkish, its occurrence is confined to passivised transitives only, giving rise to ungrammaticality when used with intransitives:

- (52) a. *Nerede dog-ul-ur bizim tarafimizdan?

where bear-PASS-AOR by us.

Intended interpretation: Where is it possible to be born by us?

- b. *Herkes tarafından okul-a gid-il-ecek.

by everyone school-DAT go-PASS-FUT

Intended interpretation: There will be a going to school by everyone.

One way of analysing the adverbial phrase is to assign it the status of an argument, on the basis of its coreferentiality with one of the arguments of the root verb.¹⁶ To my knowledge there is no evidence in Turkish that agent phrases are arguments. Although it is theoretically possible to have a suppressed argument reemerge as an argument, it would be difficult to reconcile this with passives of intransitives which do not allow agent phrases. Another possibility is to treat agent phrases as having properties of both arguments and adjuncts, a-adjuncts to use the terminology of Grimshaw (1990). According to this view, agent phrases are licensed by argument structure (which is a syntactic reflection of lexical conceptual structure) but unlike arguments they do not satisfy argument positions. The fact that they cannot occur in middle or active constructions is taken as evidence that they are licensed by argument structure, in particular by a suppressed argument. Although the account provided in Grimshaw (1990) pinpoints significant aspects of the agent phrase, attributing it an argumentlike status (in the case of Turkish) is unmotivated, and does not provide any advantages. Finally, there are accounts (cf. Roberts 1987, Zubizarreta 1987) where the agent phrase is analysed as an adverbial and its construal is subject to the same kind of constraints as other adverbials. The view we take here with respect to the behaviour of agent phrases in Turkish agrees with this final proposal. The *tarafından*-phrase, similar to an adverbial of time which specifies the time indicated by the tense element, indicates that the action which took place was performed by a specific agent. In other words it restricts the interpretation of the agent of the event.

The most striking examples for supporting the adverb analysis for *tarafından* phrases comes from non-passive clauses. The occurrence of the *tarafından* phrase in Turkish is not restricted to passive phrases, and it has a more general interpretation than an agentive phrase. It can occur in non-passive constructions as well, in which case it means 'on behalf of':

- (53) Bizimkiler Fatma-ya benim tarafımdan bir düğün hediyesi al-dı-lar.
 my-family -DAT on my behalf a wedding gift buy-PAST-3pl
 My family has bought Fatma a wedding gift on my behalf.

(53), a non-passive sentence, cannot invoke the agentive reading of the *tarafından* phrase. It can also occur in causatives as observed by Chung (1976b) and Zimmer (1976). In such cases, the agentive reading of a *tarafından* phrase might get suppressed even when a passive suffix is present:

- (54) Fatma-ya benim tarafımdan bir düğün hediyesi al-ın-dı.
 -DAT on my behalf a wedding gift buy-PASS-PAST-3
 a. A wedding gift has been bought for Fatma on my behalf.
 b. ?A wedding gift has been bought for Fatma by me.

In view of such examples, it seems to be appropriate to assign the *tarafından* phrase a more general characterisation than merely being coreferential with the suppressed argument of the passive. Its agentive construal in passives is merely an epiphenomenon of the presence of one of the arguments of the verb, in fact, it is the most relevant interpretation one can assign to the *tarafından* phrase.

In this section we provided a representation for argument absorption as it applies in passive clauses and analysed a number of syntactic constructions under this new approach. We now turn to a discussion of other instantiations of argument absorption,

middle and reflexive constructions.

5.4 Middle constructions

The cross-linguistic classification of voice includes a third category in addition to passives and reflexives, the middle construction. Middle constructions are taken to be distinct from active sentences in terms of the surface position of the internal argument, which in the former appear as subjects. They are distinct from passive constructions because they either lack a passive morpheme as in English, exemplified by (55), or they actually have a morpheme distinct from the passive as in the Greek example in (56)

(55) a. Certain books read more easily than others.

b. Take-aways sell very well on holidays.

(56) a. Afto to kimeno metafras-ti-ke efkola (apo ti Maria).

this(NOM) the(NOM) text(NOM) translate-PASS-PAST-3 easily (by Maria)

This text was translated easily by Maria.

b. Afto to kimeno metafras-ete efkola (apo opiondhipote).

this(NOM) the(NOM) text(NOM) translate-MID easily (by anyone).

This text translates easily (by anyone).

(From Capritsa, Göksel and Kempson 1991)

The defining property of middle constructions is that they necessarily induce generic interpretation. Middle constructions are usually incompatible with a tense which refers to a specific temporal segment:

(57) a. *Certain books have read more easily than others.

b. *Take-aways sold very well at three o'clock yesterday.

It has been argued (Bainbridge 1987) that Turkish has middle constructions as well. The arguments supporting this claim are based on sentences which have a passive suffix yet refer to a property of the surface subject rather than to a specific event:

- (58) a. Bu kapı anahtar-la aç-ıl-ır.
 this door key-INS open-PASS-AOR
 This door can be opened by a key.
- b. Şehr-e bu yol-dan gid-il-ir.
 town-DAT this road-ABL go-PASS-AOR
 One can go to the city by this road.

The aorist suffix reinforces the genericity effect in these sentences. However, it is not possible to associate a middle reading in Turkish with an aorist or a separate middle suffix. The latter does not exist,¹⁷ and it is possible to have the property reading with any tense or aspect:

- (59) a. Bu kapı hergün anahtar-la aç-ıl-ıyor.
 this door everyday key-INS open-PASS-AOR
 This door opens everyday with a key.
- b. Bu kapı ne zaman aç-ıl-acak.
 this door when open-PASS-FUT
 When will this door open?
- c. Bu kapı kendiliginden aç-ıl-dı.
 this door on its own open-PASS-PAST
 This door opened on its own.

What seems to be inducing a so-called middle reading is in fact the lack of an agent phrase in these sentences. The generic effect is a direct outcome of the unspecified agent and it is not a separate syntactic phenomenon which has to be characterised within the grammar. Once the examples above are supplied by agent phrases the middle reading disappears and the resulting passive counterparts are still generic in interpretation:

- (60) a. Bu kapı ancak bir çilingir tarafından aç-ıl-ır.
 this door only a locksmith by open-PASS-AOR
 This door can only be opened by a locksmith.
- b. Oda-da otururken birdenbire kapı aç-ıl-dı.
 room-DAT while sitting suddenly door open-PASS-PAST
 While (we were) sitting in the room, suddenly the door opened.

In the sentences above it is the presence of the agent phrase, and only this, that produces a different reading. The absence of the agent phrase in (60a) would provide a reading in which the agent can be anyone, or anything, including the door itself. There is no tense, person, or aspect marker that identifies a construction as a middle in Turkish. The only factor that induces a middle reading is the absence of adverbials. Claiming that middles are constructions which use the passive morpheme and preclude agent phrases would be vacuous. Instead, when an agent phrase is absent one gets a middle reading, or more precisely, a reading in which the agent is arbitrary and irrelevant. Since there is no independent means of distinguishing a middle construction as such one can conclude that the middle is not specified in the grammar of Turkish but is merely a descriptive term indicating that the agent is arbitrary. The syntactic correlate of this is that the sentence does not have an adverbial referring to the agent. That is, the presence of an agent phrase as in (60a) imposes a restriction on the reading and that is all it does.

The representation of reflexivisation should include a number of generalisations. Being an argument reducer, the reflexive is similar to the passive but the crucial factor that distinguishes it from passivisation in Turkish is its effect of inducing a one-place-predicate by attaching to two-place predicates. This aspect of reflexivisation should be directly characterisable in its representation. Another factor is the coreferentiality of the suppressed element with the subject. This aspect of reflexivisation should fall out directly from its characterisation without stipulation. And finally, the representation should be general enough to account for the diversity in the status of the ‘absorbed’ element. The most common effect of reflexivisation is the suppression of the internal argument of the verb:

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However, it can occasionally have the effect of suppressing a non-argument such as the example below:

- (62) a. Naz elbise-yi (kendi üstü-n-e) giy-di.
 dress-ACC on self-POSS-DAT wear-PAST

Naz wore the dress (on herself).

- b. Naz giy-in-di.
 wear-REF-PAST

Naz got dressed.

The oddity of this example is that the verb *giy* ‘wear’ is itself an action one inflicts upon oneself, and the internal argument of this verb cannot be ‘self’. Nevertheless it combines with the reflexive suffix just as the other verbs do, with a similar interpretation. This being the case, one would have to account for how the suppression of the internal argument in the case of *giy* induces a reading in which the coreferentiality is maintained. In other words, we have to give an account for why *giy-in* does not mean ‘wear self’, but rather it means ‘wear something on self’. We shall look at such verbs subsequently.

Let us assume that being an argument reducer, the reflexive identifies the internal argument of a verb with its external argument. To guarantee that this happens, we assign it the following control specification:

- (63) $-(i)n$: IDENTIFY FIRST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS
 VARIABLE SUBJECT TO MOST LOCAL DISCHARGE¹⁹

Notice the similarity with the control specification of the passive, a similarity which I argued should be captured to unify the process of argument suppression.

The representation of a sentence like *John döv-ün-dü* 'John beat himself' is straightforward:

(64)

		s_a		
			GOAL: $w_1:x, w_2:y, \dots w_n:z \vdash f(w_1, \dots, w_n) : t$	
John	1.	John' : e	ASSUMPTION (USE LAST)	
döv	2.	$\lambda x \lambda y [\text{döv}(x)(y)] : e \rightarrow (e \rightarrow t)$	ASSUMPTION	
-ün	3.		IDENTIFY FIRST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS VARIABLE SUBJECT TO MOST LOCAL DISCHARGE	
	4.	CHOOSE $x = y$ $\lambda y [\text{döv}(y)(y)] : e \rightarrow t$	MP 4,1	
	5.	döv' (John')(John') : t		
-dü	6.	CHOOSE $s_a = s_j, s_j < s_{utt}$ $s_j : \text{döv}'(\text{John}')(\text{John}') : t$ $s_j < s_{utt}$		

With the introduction of the reflexive the internal argument represented by the variable x is identified with the most local element, this being the external argument. Thereafter, 'John', due to its nominative marking supplies the value for the external argument, and in the same process the internal argument also gets the same interpretation.

As for the verb *giy* 'wear', one would not normally expect it to reflexivise. After all, one does not 'wear oneself' but 'wears a dress'. One immediate response is that *giy* is ambiguous between 'to wear' and 'to dress'. (62) would then be an instantiation of the second meaning. However, there are a number of verbs which behave like *giy*. These are verbs which oneself is involved in but which normally could not be expressed with the using the reflexive anaphor as a direct object. *Kuşa* 'wrap', *boşa* 'divorce' are such verbs. These verbs are conspicuous, because the reflexive which attaches to these is homophonous with the passive. But the result is clearly reflexive: *kuşa-n* does not mean 'to be wrapped by someone' but 'to wrap oneself', similarly *boşa-n* does not

mean to be divorced by someone but to be divorced. Constructions with these verbs disallow agent phrases altogether, which does not have any obvious reason except that these are reflexive.

It is very difficult to give these three verbs a unified representation. Due to their idiosyncrasies, each build up a reflexive interpretation in a different way. We shall therefore have to assume that the three verbs *giyin*, *kuşan* and *boşan* have separate lexical representations whose semantics involves the reflexive interpretation. We can only say that this is a fossilised instantiation of the reflexive morpheme.

Finally, constructions such as (65) seem also to contain a fossilised and idiomatic usage of the reflexive, this specific one inducing an interpretation which indicates excess.

- (65) Naz kokular sür-ün-dü.
 perfumes put-REF-PAST.
 Naz put perfumes on herself.

Phrases such as *surat takınmak* 'to put on a face' also mark an idiomatic usage of the reflexive. Such idiomatisation and lexicalisation should not be surprising given that the reflexive is not a productive process.

What we have seen in this section is that reflexivisation which is also an instantiation of argument absorption can be characterised by means of mechanisms we have used for the analysis of passivisation. The major distinction between the two is the difference in the argument chosen to be identified. Certain reflexive forms which show a resistance to this type of analysis are probably the result of reflexivisation, already an unproductive process, undergoing the process of lexicalisation.

5.6 Conclusion

In this chapter I have tried to give a unified account of the processes which induce argument suppression. The characterisation given to the passive and to the reflexive demonstrates that this can be achieved in terms of an analysis requiring one argument to be identified via a most local dependency relation. The passive and the reflexive then differ as to which variable is to be so identified. I have also argued that there is no separate middle construction in the grammar of Turkish. We have further seen that the analysis of case assignment provided in the preceding chapter needs no modification and can be applied directly to passive and reflexive constructions. We next turn to the combination of the causative, passive and reflexive suffixes.

NOTES

1. Ergin (1989) suggests that *-il* has a passive meaning as well as what he refers to as a broader meaning, but points out that this distinction cannot be captured morphologically. Bainbridge (1987), on the other hand, appears to be favouring a separate characterisation for a middle morpheme by stating that there are two *-il/-i)n* pairs. Although she does not explicitly state that the *-il* of *-il/(i)n*₂ is the middle morpheme, a description of the remaining morphemes may lead one to this conclusion.
2. The pertinence of human agency has been observed before, cf. Knecht (1985), Biktimir (1986), Özkaragöz (1986).
3. There are verbs which have this suffix yet are not reflexive, such as *görün* which does not mean 'to see oneself' but 'to appear', and *sevin* which does not mean 'to make oneself happy' but 'be happy'. Such verbs have to be listed separately in the lexicon with their idiosyncratic meaning.
4. Although these constructions are called passives, neither language has a morphological factor that distinguishes the passive form of the verb from its active form. But the common factor is that the direct object moves to the sentence initial position, assuming the characteristics of subjects. If these are indeed passive constructions then the lack of passive morphology would need to be explained.
5. I am indebted to Jan Chiang for drawing my attention to this.
6. In Baker's framework, generating PASS under the spec of IP is necessary for some reasons but impossible for others. It is necessary because Baker claims that the passive is an argument which receives the external theta role when there is one. If it has the status of an argument it must be X-max. So according to X' theory (and UTAH) it should be generated under the specifier position of INFL. But because it does not have full NP status Baker is forced to claim that it is base-generated under I.
7. This analysis is based on Capritsa, Göksel and Kempson (1991). Below, I shall draw on freely from this work making slight reformulations as necessary.

8. For some native speakers this factor is animacy rather than humanness. This issue does not have any ramifications on the discussion here; for those dialects in which the animacy factor holds, the human factor in lexical specification of the passive is simply replaced by animacy.

9. Recall that HOLD is a metalanguage device that expresses truth-dependent relations thereby constraining the interpretation in a given relation. In the case of the passive, the filter introduced by HOLD is weakened allowing for the agent to be personified.

10. The emphatic use of the double occurrence of passivisation is also found in sequences without an intervening modal as a disambiguation mechanism distinguishing passives from reflexives when they are homophonous. See Özkaragöz 1986a for further examples.

11. In such constructions *iste* requires the presence of progressive or generic aspect for which I have no explanation at this stage.

12. One explanation could be that the sentences in (44) are not ungrammatical but they are judged to be unacceptable by native speakers. The reason for this would be the following: clausal subjects in Turkish are nominative without exception. Therefore a nominative NP is parsed as the subject of a sentence. Considering that there is subject verb agreement in Turkish an agreement marker is added onto the verb to make them "better". The criteria for distinguishing between "grammaticality" and "acceptability" which is at issue here, are not always clear. For certain constructions, there is no difficulty in drawing a line between these two. Syntax textbooks usually include sentences which are grammatical yet unacceptable, and there is generally little dispute among linguists in these cases (cf. Newmeyer 1983). It is an issue of interest that examples of "ungrammatical" yet acceptable constructions are more difficult to come across. One reason for this is that since they are acceptable, there is the general belief that they must be grammatical. This belief lies in the misconception that whatever native speakers utter must be generated by the grammar. If we were to question this belief with respect to constructions in (42) we could then claim that these constructions are

ungrammatical but acceptable. That is, what the grammar generates when there are two such occurrences of passive morphology is taken to be unacceptable because of the status of the nominative NP which I mentioned above. In fact, no analysis which is purely based on grammatical considerations can account for the sentences in (42) because they are not generated by the grammar, but are saved by additional mechanisms external to the grammar.

13. I assume that by using the term syntactic activity, Brody and Manzini are following the definition of implicit arguments given by Safir (1988), according to whom an implicit argument is defined as an argument which is projected but not linked, where the term projected refers to the non-inert nature of a lexical item at D-structure, and linkage refers to its association with a specific position.

14. Similar constructions are possible in English too. *Prince Charles was brought up to be King* does not mean Prince Charles was brought up by someone such that person would be king.

15. Linear order is significant as well. When *Mohammed Ali* is moved, then there is only a single interpretation, one in which *Mohammed Ali* was beaten by x for x to become champion. These can be represented in LDS which represents linear order as the order of elements appearing in the database.

16. The abstract from a talk given by Kornfilt (1986) suggests that her analysis is closer to taking the agent phrase as an argument rather than as an adverbial. She argues that agent phrases are allowed only when the surface subject is in a Θ -chain via the passive morpheme. For her, the difference between passives of transitives and passives of intransitives can be stated in terms of the presence or absence of Θ -chains. She claims that when there is a subject (as in transitives) a Θ -chain is formed, when there isn't one it is not licensed. The licensing of agent phrases in passivised intransitives in languages like, say, Lithuanian would then have to be attributed to parametric variation in the formation of Θ -chains.

17. At first glance, there seems to be an exception to the generalisation that Turkish does not have middle suffixes. The verb *kapa* 'close' has the form *kapa-t* 'close-CAUS', the form *kapa-t-ıl* 'close-CAUS-PASS' and in addition, the form *kapa-n* 'close-*n*' where *-n* could be interpreted as a middle. The *-n* suffix cannot cooccur with an agent phrase which rules out the passive interpretation. It cannot be the reflexive suffix because of the non-human nature of the subject. The only interpretation which is available is then the middle construal. However there is another way of interpreting the facts. If one assumes that *kapat* and *kapan* are both in the lexicon and *kapa* is a truncated form of *kapat* then there is no need to invoke a middle morpheme which appears with only one verb. Lexicalised forms of this sort (which do not have a truncated form) exist in a few other cases (*öğren* 'learn', *öğret* 'teach', *yan* 'burn(INTR)' *yak* 'burn(TR)') suggesting that the language allows for such unanalysable pairs.

18. The suffix *-(i)n* also induces what are called phrasal verbs, a specification which has no connection with reflexivisation. These come up in stems such as *bak-ın* 'look-*ın*' which means 'look around'.

19. Here the notion of 'most local' extends over the set of minor premises $x_j:e$ to some major premise $\alpha_i:e^i \rightarrow t$. The combination of $x_i:e \dots x_j:e$ with $\alpha_i:e^i \rightarrow t$ is in the order $\alpha(e_j)(e_i):t$.

CHAPTER VI

COMBINATIONS

6.1 Introduction

This chapter covers an area which has received very little attention in the literature. To my knowledge, no work has been done on the combinatorial or configurational properties of the reflexive morpheme in Turkish, let alone on its interaction with the other derivational suffixes, and those which have analysed causatives and passives do not go into combinations of these morphemes (cf. Knecht 1985, Özkaragöz 1986b). As for general works on causative-passive interactions, we saw in the first chapter that the most detailed and recent of these (Baker 1988) is problematic for a number of reasons. This chapter merely attempts to display the properties of the combinations and test the predictive power of the accounts provided in the earlier chapters. Instead of aiming at full analyses of the combinations, we shall limit ourselves in most cases to displaying what we believe are interesting observations that have cross-linguistic implications. The main purpose of this chapter is to lay out certain properties and problems in the analysis of combinations with the hope that it will generate further research into the area.

Recall that we have already analysed the double occurrence of each one of the passive, causative and reflexive morphemes in sections 2.2364/4.33, 5.3211 and 5.5, respectively. This chapter will therefore only include the interaction of the causative and passive (section 6.21), the causative and reflexive (section 6.22) and the passive and reflexive (section 6.23). It should be noted that we are using the surface ordering of the suffixes as a transparent reflection of their logical combinatorial properties because in Turkish this just happens to be the case. In other words we do not consider this a universal phenomenon, and certainly not a principle of language, as will be argued in section 7.4.

6.2 Combinations of derivational morphemes

6.21 The interaction of causative and passive

Of the two possible combinations of the causative and the passive morphemes *V-PASS-CAUS* and *V-CAUS-PASS* only the latter is grammatical in Turkish. We shall first look at *V-CAUS-PASS* sequences in section 6.211, and then turn to the ungrammatical *V-PASS-CAUS* sequences.

6.211 Causative + Passive

V-CAUS-PASS sequences display an interesting property of the passive suffix in Turkish. Consider a sentence such as:

- (1) Ev yap-tır-ıl-di.
house build-CAUS-PASS-PAST
A house was caused to be built.

It seems that our previous characterisation of causative, passive and case presents a few problems with respect to the logical representation of (1) unless certain aspects of the analysis are revised. Let us see why. The first four lexical items have the following specifications:¹

- (2)
- | | | |
|------|-------|--|
| | S_a | GOAL: $w_1:x, w_2:y, \dots w_n:z \vdash f(w_1, \dots, w_n) : t$ |
| ev | 1. | ev': e ASSUMPTION |
| yap | 2. | $\lambda x \lambda y [yap' (x)(y)] : e \rightarrow (e \rightarrow t)$ ASSUMPTION |
| -tır | 3. | $\lambda \Phi \lambda z [tır' (\Phi)(z)] : t \rightarrow (e \rightarrow t)$ ASSUMPTION |
| -ıl | 4. | IDENTIFY LAST ARGUMENT OF IMMEDIATE
PREDICATE $V(x_1, \dots, x_n)$ AS VARIABLE
SUBJECT TO MOST LOCAL DISCHARGE |

The problematic aspects are the following:

- (i) the specification of the causative in line 3 cannot be fulfilled unless the type

specification of the root verb is satisfied. As it is, there is no means by which the root verb will combine with two arguments because there is only one.

(ii) In the case of the overt expression of the additional argument (the external argument of the root verb), this is expressed in the dative case. Such sentences have two interpretations only one of which is relevant here. (The interpretation in (i) below is the adverbial usage of the dative, which is not relevant to the discussion):

- (3) İşçiler-e ev yap-tır-ıl-di.
workers-DAT house build-CAUS-PASS-PAST

- (i) A house was caused (by someone) to be built for the workers.
(ii) ??A house was caused (by someone) to be built by the workers.

The one which is relevant is (3ii), in which the dative is the causee. Such a construal is marginally acceptable. The problem is that our characterisation of case predicts incorrect results with respect to the distribution of case markers. Recall that the nominative directs its adjacent argument to be the last one to combine. Such a specification incorrectly assigns the NP *ev* 'house' to the external argument position of the verb *yap* 'build', whereas this NP is its internal argument. Assuming that the dative marks an NP which is neither the last nor the first to combine compounds the problem, because it incorrectly forces its adjacent NP to combine as if it were the internal argument of the root verb, whereas it is the external argument. In other words, the case specifications we have provided for the nominative and the dative are, in this case, the reverse of what they should be.

I suggest the following approach as a possible solution to these problems. It should be remembered that the passive identifies the last argument as the one to be discharged most locally. The contender for the "last argument" appears to be the one created by the presence of the causative. The proof not only displays this physically, but the content of this argument would be the one to appear as the agentive phrase

concomitant with the passive. Recall that the notion of last argument in the control specification of the passive refers to the last argument in the argument structure of the verb, and it creates no clash with the specification of the nominative. What we have so far assumed to be the lexical specification of the passive was that it singled out only one such argument. But suppose that the passive applies to each predicate. This would mean that not only the external argument of the causative but also the external argument of the root verb were chosen as targets. The main objection to such a proposal would be the violation of uniqueness (cf. section 7.22). In particular once we assume that a specification can apply twice, what stops any principle from applying more than once systematically? To circumvent this problem, I would like to exploit the distinction between repetition in the inference system versus repetition in instructions building the inference system. While the former creates a uniqueness violation (such as theta criterion violations), the latter is witnessed in natural language in certain constructions. Control structures which involve the using of a premise twice (John' in *John wants to leave*) or cases described as the Avoid Pronoun Principle bear witness to the fact that certain instructions can be used more than once. We suggest that the passive in Turkish operates in similar fashion.

Such a proposal would have certain advantages. First of all the problem of case marking would disappear. The passive would take both external arguments (the external argument of the root verb and that of the causative predicate) and identify them as dependent variables, in line with the analysis provided before. As a result, there would only be one argument slot left, the internal argument position of the root verb. The nominative marked NP would then combine at exactly the point it should in accordance with its status as the internal argument of the root verb. Notice that this proposal underpins a natural fact about sentences such as (1). These sentences entail ordinary passive sentences that are not causative. That is, a sentence such as:

- (4) Ahmet döv-dür-ül-dü.
beat-CAUS-PASS-PAST

Ahmet was caused to be beaten.

entails 'Ahmet was beaten', and cannot mean 'Ahmet made someone be beaten'. Considering that 'beat' has two argument slots, there should be no reason why *Ahmet* should not fill the external argument slot of 'beat'. But if this slot is already identified by the passive, as we suggest, this option no longer exists.

Another advantage of this proposal is that it supports our analysis of the causative as having declarative content and thus forming a natural class with verbs, rather than being classified with other derivational morphemes such as passives and reflexives. Both lexical verbs and the causative predicate have lexical specifications of a declarative nature and their availability as the target of a control specification (such as the one provided by the passive) requires no additional characterisation.

What remains to be explained is how *işçilere* 'workers-DAT' gets interpreted as the external argument of the root verb in the marginally acceptable (if at all) interpretation illustrated in (3ii). I suggest that, for the speakers which get this interpretation, the dative assumes its second function as being the marker of an adverbial, rather than marking an argument. Such a stance may raise questions regarding the status of our analysis of the dative marker. Recall that we attributed two disjoint properties to the dative following from the observation that case markers can have distinct functions. One of these was its function as the marker of an *argument*, the causee, and the other one was its function as the marker of an *adverbial*. The first specification directed an argument to a specific argument slot, the second was a type specification which when combined with a one-place predicate provided a one-place predicate. But here it seems as if we are conflating these two functions: we are using the particular specification of the dative as marking an adverbial in order to explain the

status of the causee. In other words, in a construction containing the standard instantiation of a dative marked causee, we are employing the mechanism which is reserved for interpreting it as an adverbial. It is actually the marginality, and near ungrammaticality of these constructions which leads to the conflation of these two functions. The dative NP in a causative construction is the causee. However, using the specification of the dative reserved for marking the causee leads to inconsistency in the syntactic representation of argument structure. Therefore the other function of the dative takes over. It is for this reason that sentences such as (3) are generally interpreted as having the dative marked NP assume a non-ambiguous adverbial function such as 'for'.

An interesting outcome of the analysis presented here is that the full construal of lexical items has to wait until further specifications are made available. This provides further evidence that the combinatorial process does not force all properties, mechanisms and specifications to be fulfilled in sequence in order for the proof to proceed. There can, at times, be items entered in the database whose properties cannot be fulfilled until a later stage when other items are entered. We can now give the proof for (1):

(5)

		s_a	GOAL: $w_1:x, w_2:y, \dots, w_n:z \vdash f(w_1, \dots, w_n) : t$	
ev	1.	$ev' : e$	ASSUMPTION (USE LAST)	
yap	2.	$\lambda x \lambda y [yap' (x)(y)] : e \rightarrow (e \rightarrow t)$	ASSUMPTION	
-tir	3.	$\lambda \Phi \lambda z [tir' (\Phi)(z)] : t \rightarrow (e \rightarrow t)$	ASSUMPTION	
-il	4.		IDENTIFY LAST ARGUMENT OF ALL IMMEDIATE PREDICATES $V(x_1 \dots x_n)$ AS VARIABLES SUBJECT TO MOST LOCAL DISCHARGE	
	5.	CHOOSE $z = g(s_a)$		
	6.	CHOOSE $y = g(s_a)$		
	7.	$\lambda y [yap' (ev')(y)] : e \rightarrow t$	MP 1,2	
	8.	$yap'(ev') (g(s_a)) : t$		
	9.	$\lambda z [tir'(yap'(ev')(g(s_a)))(z)] : e \rightarrow t$	MP 3,8	
	10.	$tir'(yap'(ev') (g(s_a)))(g(s_a)) : t$		
-di	11.	CHOOSE $s_a = s_j, s_j < s_{utt}$ $s_j : tir'(yap'(ev') (g(s_j)))(g(s_j)) : t$		

In the first three lines the lexical properties of the items are given. At this stage there is no possibility of combining any of these. With the appearance of the passive suffix in line 4, the external arguments of both of the predicates, the root verb and the causative in lines 2 and 3 are identified as a dependent elements, and they are construed as dependent on the temporal specification as is the case in simple passives. This takes place in lines 5 and 6. Now at this stage, what stops the proof from applying these values directly is the order in which functional application takes place. If, say line 7 were the point at which the value for z were to be realised, this would not have been possible simply because a previous combination, namely the combination with t to yield an $e \rightarrow t$ would not have taken place, and the variable z would not have been accessible. Similarly with y . Therefore at this stage the process of abduction forces the proof to search for another possible option. This option is the one provided in line 7: the value for the remaining variable is provided. Notice that this is a straightforward process. The nominative marker forces its adjacent argument to combine last and since the other

variables are already given a value, the proof can proceed. The remaining part of the proof proceeds in familiar fashion.

6.212 Passive+Causative

Next we look at *V-PASS-CAUS* sequences which are ungrammatical in Turkish. There have been proposals (Zimmer 1976) arguing that the semantics of such sequence are already captured without the presence of the passive morpheme and that *V-CAUS* sequences are inherently passive. The main problem with this proposal is that the notion of 'inclusion of passives within causatives' is based on a naive view of meaning, one we cannot reconcile with the notion of meaning and structure which we have been trying to articulate. To give an example, almost any verb in Turkish entails a passive "meaning". A sentence like (6) necessarily means that 'there was a running':

- (6) Çocuklar-ı koş-tur-du.
 children-ACC run-CAUS-PAST
 S/he made the children run.

But this is true even if there is no causative marker. So the presence of the causative as inherently containing a passive does not follow. Secondly, attributing an inherent passive sense to causatives does not explicitly spell out the factor(s) which rule out the presence of the passive morpheme. Finally, that proposal would assume that no language has *V-PASS-CAUS* sequences. This is not the case as attested by languages such as Japanese and Chamorro, ruling out the possibility of conceptual reasons for their exclusion from Turkish. This is supported by the fact that passives can be embedded under periphrastic causatives in Turkish. These facts indicate that causativising a passive is disallowed by language specific properties.

I suggest that the (un)grammaticality of *V-PASS-CAUS* sequences in Turkish is linked to the interaction of language specific properties of passivisation, causativisation

and case marking, and in particular to whether there is a clash between the control specification provided by the accusative and that provided by the passive. The prediction is that passives can occur inside causatives only in languages that allow passives to cooccur with accusative marked NPs. I shall first evaluate the predictive power of our characterisation of the accusative case marker and the passive morpheme. Then I shall turn to what seems to be an internal inconsistency.

In section 4.32 I argued that the specification of the accusative in Turkish was such that it forced an argument to be the first one in the combinatorial process *if there were other arguments in the argument structure of the predicates in the database*. Later in section 4.43 I suggested that languages varied with respect to properties of case markers, and that in some languages the presence or absence of other arguments was irrelevant for the lexical properties of case markers. The requirement, in Turkish, that a sequence of arguments be present clashes with the properties of the passive. The passive leaves at most one argument in the database, resulting in an unsuitable environment for the accusative which requires a sequence of arguments. Therefore passives and accusatives cannot occur together in Turkish. We suggest that *V-PASS-CAUS* sequences with accusatives are incompatible for the same reason. In order to understand the mechanism of this interaction better, let us look at a language which has morphological causatives and passives but which also allows accusative case marked NPs cooccurring with these. Japanese is such a language. In Japanese passive clauses can contain accusative NPs:

Japanese

- (7) Taroo ga doroboo ni zitsensya o nusum-are-ru.
 NOM thief DAT bike ACC steal-PASS-TNS

A thief steals his bike, and Taro is adversely affected.

(From Marantz 1984)

Another, possibly related, property of Japanese is that both the direct object and the oblique object of an active clause can function as the subject of a passive sentence:

- (8) a. John ga Mary ni kunsyoo o atae-ta.
 NOM DAT medal ACC give-PAST
 John gave the medal to Mary.
- b. Kunsyoo ga John ni Mary ni atae-rare-ta.
 medal NOM by DAT give-PASS-PAST
 The medal was given to Mary by John.
- c. Mary ga John ni kunsyoo o atae-rare-ta.
 NOM by metal ACC give PASS-PAST
 Mary was given a medal by John.

(From Kuno 1973, cited in Baker 1988)

We shall refer to constructions where the internal argument appears as the surface subject, as in (8b) as DO-passives and those where the oblique object of the root verb appears as the surface subject as IO-passives. The significance of IO-passives here is that they illustrate the ability of the accusative case marker to appear with the passive. It is these constructions, and not DO-passives which are available as targets of causativisation. The reason for this is as follows: causativisation in Japanese has the effect of marking the subject argument of the embedded clause dative and leaving the accusative marked object as it is. When a sentence like (9a) appears as the complement of the causative it has the case marking pattern shown in (9b):

- (9) a. Hanako ga sono hon o kaw-ta.
 NOM that book ACC buy-PAST
 Hanako bought that book.

- b. Taro wa Hanako ni sono hon o kaw-(s)ase-ta.
TOP DAT that book ACC buy-CAUS-PAST
Taro made Hanako buy that book.

(From Farmer 1984)

Given that causativisation alters case marking in this way, it is not surprising that causativised passives have the following case marking, where the causee is marked accusative:

- (10) Mary wa Taro o Zi-roo ni home-rare-sase-ta.
TOP ACC DAT praise-PASS-CAUS-PAST
Mary made Taro be praised by Zaroo.

(From Marantz 1985, cited in Baker 1988)

- (11) Kontuko ga John o (Bill ni) nagur-are-sase-ta.
director NOM ACC by hit-PASS-CAUS-PAST
The director made John be hit by Bill.

(From Rosen 1990)

However when a DO-passive such as (8b) is causativised the outcome is ungrammatical:

- (12) *Taro wa kunsyoo ni atae-rare-sase-ta.
TOP medal DAT give-PASS-CAUS-PAST²

In other words, the grammaticality of *V-PASS-CAUS* sequences appears to be contingent on the possibility of having an accusative marked internal argument. This follows only if the properties of accusatives in Japanese are different from Turkish accusatives: the properties of the accusative case marker in Japanese would allow it to cooccur with the

passive only if it is not sensitive to the presence of a sequence of arguments, a crucial characteristic of the Turkish accusative. This captures the insight that a causative requires an accusative marked NP, and if the passive is incompatible with this case marker, *V-PASS-CAUS* is simply disallowed.

That passivisation is compatible with, or even in some cases requires, the accusative in Japanese is further supported by *V-CAUS-PASS* sequences:

- (13) a. Hanako wa Taroo ni sono hon o kaw-**asesa-rare-ta**.
 TOP by that book ACC buy-**CAUS-PASS-PAST**
 Hanako was made by Taroo to buy that book.
- b. *Sono hon wa Taroo ni Hanako ni kaw-**asesa-rare-ta**.
 that book TOP by DAT buy-**CAUS-PASS-PAST**
 Intended interpretation: That book was by Taroo made to be bought by Hanako.

The external argument of the root verb only, and not its internal argument can appear as the subject of a passivised sentence which has an embedded causative clause. This is why (13a) is grammatical and (13b) ungrammatical.

Similar facts hold in Chamorro as illustrated by the following *V-CAUS-PASS* sequence (appearing as *PASS-CAUS-V* due to prefixation):

Chamorro

- (14) **Ma-na'-fa'**gasi si Henry ni kareta nu i famagu'un.
 PASS-CAUS-wash PL OBL car OBL the children
 Henry was made to wash the car by the children.

(From Baker 1988)

Again it is the external argument of the root verb which becomes the matrix subject when passivised, parallel to (13a). And once again, as in Japanese, we find that *V-PASS-CAUS* sequences are grammatical in Chamorro:³

- (15) Si nana ha **na'-ma-fa'**gasi i kareta ni lalahi
 PN mother 3sS-CAUS-PASS-wash the car OBL males
 Mother had the car be washed by the boys.

(From Baker 1988)

It is interesting to note that although Turkish has *V-CAUS-PASS* constructions as shown above, their structure is not similar to the structure of *V-CAUS-PASS* constructions in Japanese and Chamorro. In Turkish it is the embedded object (16a), and not the embedded subject (16b) which becomes the subject of the matrix clause:

- (16) a. Kitap biz-e oku-t-ul-du.
 book(NOM) we-DAT read-CAUS-PASS-PAST
 The book was made to be read by us.
- b. *Biz kitab-ı oku-t-ul-du-k.
 We(NOM) book-ACC read-CAUS-PASS-PAST-1pl
 (Intended interpretation: We were made (by someone) to read the book.)

And of course, unlike Japanese and Chamorro, the accusative case marker is incompatible with passivisation in Turkish as illustrated below:

- (17) *Mary madalya-yı ver-il-di.
 medal-ACC give-PASS-PAST
 Intended reading: Mary was given the medal.

It is for the same reason that *V-PASS-CAUS* sequences are disallowed in Turkish:

- (18) *Sema bu ev-i yap-ıl-dır-dı.
 this house-ACC build-PASS-CAUS-PAST.

(Attempted reading: Sema caused this house (to) be built.)

If the problematic accusative were to be replaced by nominative case in (18), the sentence above would still be ungrammatical. Turkish does not allow two nominative case marked NPs, concomitant with the specification of the nominative in Turkish directing its adjacent argument to combine last irrespective of the presence of other arguments. Two occurrences of such a specification would be incompatible. This renders *V-PASS-CAUS* sequences with two nominative NPs ungrammatical in Turkish:

- (19) *Sema bu ev yap-ıl-dır-dı.
 (NOM) this house (NOM) build-PASS-CAUS-PAST.

(Attempted reading: Sema caused this house (to) be built.)

From the languages we have looked at we can tentatively draw certain generalisations. There seems to be pattern in causative/passive interactions which is illustrated below:

(20)	Passive with ACC	V-CAUS-PASS with embedded subject as matrix subject	V-CAUS-PASS with embedded object as matrix subject	V-PASS-CAUS
Japanese	yes	yes	*	yes
Chamorro	? ⁴	yes	*	yes
Turkish	*	*	yes	*

This chart is not definitive and the interaction of the separate elements involved in these processes require a full understanding of the case system in each language.

We are now in a position to return to the apparent inconsistency mentioned at the beginning of this subsection. The reason, I argued, for the ungrammaticality of *V-PASS-CAUS* in Turkish was the clash in the control specification of the passive and the accusative. Turkish passives do not allow accusative NPs because the control specification of the accusative in Turkish requires the presence of a chain of arguments. I then carried this explanation over to explain the ungrammaticality of *V-PASS-CAUS* sequences, disallowing them on the grounds that the argument suppression property of the passive left only one argument, a situation which prevented the accusative from applying its properties. But what about the properties of the causative, which generates another argument slot, thereby creating a suitable environment for the accusative to function? Informally put, one of the arguments of the verb which is $e \rightarrow (e \rightarrow t)$ is 'lost', but the causative which is $t \rightarrow (e \rightarrow t)$ introduces another one, which undermines the argument that such sequences are ruled out on the grounds that the accusative is in the wrong environment. In fact, an underived intransitive does combine with a causative and the NP in question gets accusative marking without a problem. Therefore the question is the following: why are *V-PASS-CAUS* sequences incompatible with the properties of the accusative case marker whereas *V_{INTR}-CAUS* sequences are compatible with it?

A number of options can be considered (which will also be seen to apply to the ungrammatical *V-REF-CAUS* sequences):

1. The causative creates a separate database, contra the arguments in section 4.331. If we allowed this to happen it still would not explain the difference between *V_{INTR}-CAUS* and *V-PASS-CAUS* unless we argued that the former was lexicalised. This suggestion is untenable on the grounds that *V_{INTR}-CAUS* behaves just as *V_{TR}-CAUS* with respect to all the factors mentioned in the subsection referred to.
2. The accusative case would be lexically specified for not combining with *V-PASS-CAUS* sequences. This would be highly stipulatory and therefore lack explanatory power.
3. The passive morpheme somehow creates an opaque domain in which the accusative

is unable to operate. This might require a reevaluation of the notion of database, suggesting that there might be types of databases differing from one another with respect to sensitivity to locality restrictions. Informally put, this would mean that derivational morphemes with control specifications (the passive and the reflexive) have the power to close off a certain structure, thereby disabling the accusative case marker's operational capacity, but at this stage we are unable to say how this would be characterised. An advantage of this proposal would be that it would directly bear upon the properties of the passive and the accusative, which seem to show a pattern of (non)/cooccurrence, as we discussed above. In addition, attributing part of the problem to the control specification of the accusative marker would probably be a key factor in explaining the low-level surfacy ungrammaticality of these constructions: although completely ungrammatical, native speakers have no problem in interpreting these constructions, as opposed to some other ungrammatical sequences which are impossible to interpret, as we shall see shortly.

In closing this section, I would like to recapitulate that the properties of the accusative case marker in Japanese and Chamorro are evidently different from their Turkish counterpart,⁵ as are the properties of the nominative in Japanese where two instantiations are permitted. The exact properties of the accusative case marker in Japanese require the analysis of more data than is possible here,⁶ but one might suggest that neither the accusative, nor the nominative in Japanese appear to be insensitive to the presence of a chain of arguments, although other factors seem to be interacting with this property.

6.22 *The interaction of causative and reflexive*

6.221 *Reflexive + Causative*

As might be expected, *V-REF-CAUS* sequences are ungrammatical in Turkish. The reason for this is similar to the reason mentioned above which rules out *V-PASS-CAUS* constructions. Accusative case marking is incompatible with reflexivisation in Turkish

just as it is with passivisation. A sentence such as

- (21) *John Mary-i yıka-n-dır-dı.
 -ACC wash-REF-CAUS-PAST

Intended reading: John made x wash x.

would be ruled out because of a clash with the accusative marker, similar to the clash in the interaction of the passive and the causative. We have no remarks to add to the ones made above.

6.222 Causative+Reflexive

V-CAUS-REF sequences are also ungrammatical in Turkish, and to my knowledge, they are universally ungrammatical. (To be more precise, such sequences may be found in certain languages, but they would necessarily have to allow the reflexive to logically combine before the causative.) Our analysis directly predicts these facts. To see why, we first have to understand what such sequences could possibly mean. The application of a reflexive to a causative requires the causative to serve as the input to reflexivisation. If we take a causative sentence such as:

- (22) John made Mary wash Bill.

the effect of the reflexive as applied to this would be the following: either the internal argument of the root verb (i.e. *Bill*), or the external argument of the root verb (i.e. *Mary*) would have to be coreferential with *John*. Notice that this is the case irrespective of one's analysis of the parts. In other words, the application of the reflexive to the causative cannot yield sentences such as:

- (23) X made Y wash Y.⁷

because this would involve the application of the causative to the reflexive (i.e. *V-REF-CAUS*), the reverse of the sequence which we are looking at now. The application of the reflexive to the causative could then, in principle have two interpretations:

- (24) a. X made X wash Y.
 b. X made Y wash X.

Now let us take a sentence such as (25):

- (25) *John yika-t-in-di.
 wash-CAUS-REF-PAST

According to our conclusion in (24), (25) could have four interpretations:

- (26) (i) John made p wash John.
 (ii) p made John wash p.
 (iii) John made John wash p.
 (iv) p made p wash John.

The proof, in any case would start as follows with the logical types numbered to simplify the explanation:

(27)

		s_a	
			GOAL: $w_1:x, w_2:y, \dots w_n:z \vdash f(w_1 \dots w_n) : t$
John	1.	John': e	ASSUMPTION
yika	2.	$\lambda x \lambda y [yika' (x)(y)] : e_1 \rightarrow (e_2 \rightarrow t)$	ASSUMPTION
-t	3.	$\lambda \Phi \lambda z [tir' (\Phi)(z)] : t \rightarrow (e_3 \rightarrow t)$	
-in	4.	IDENTIFY FIRST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS VARIABLE SUBJECT TO MOST LOCAL DISCHARGE	

Which argument one takes the reflexive to mark as the first to be identified turns out to be a significant factor. It cannot be the argument labelling e_2 because this argument is in no sense the first argument: in the argument structure of 'wash' there is the internal argument which would count as the first one, i.e. the one labelling e_1 .⁸ This rules out interpretations (iii) and (iv) above. We therefore have to take 'the first argument' to mean either that which is associated with e_1 , or on a more local interpretation of the specification of the reflexive, we can take it to mean the argument associated with e_3 . Let us take each one in turn.

Suppose that the target argument of the specification of the reflexive is the argument labelling e_3 . Now this option also rules out (iii) and (iv) for a different reason. Since it has to be identified most locally, it can only be dependent on the database label, because this is all that is available to it. The next step in (27) would then be

(28) CHOOSE $z = g(s_a)$

The result would yield an immediate loss of any possible reflexive interpretation because the point of having the reflexive is to identify an argument with another argument. The option of having the argument associated with e_3 as the dependent variable is, thus, not

available. That is, having the causee and the subject as being coreferential is impossible for two separate reasons, ruling out options (iii) and (iv) (of (26)).

We are thus left with the option of having the argument labelling e_1 as the dependent variable. In other words, we can only have interpretations (i) and (ii), where the internal argument of the root verb is coreferential with the matrix subject. (25), repeated below can, therefore, only have the interpretations (i) and (ii):

(29) *John yika-t-in-di.

wash-CAUS-REF-PAST

(i) John made (someone) wash John.

(ii) Someone_i made John wash someone_i.

We shall now discuss these two options.

(i) The first interpretation is 'John made p wash John', which requires the coreference of the labels associated with the boldfaced e_1 and e_3 below:

(30) yika : $\lambda x \lambda y$ [yika' (x)(y)] : $e_1 \rightarrow (e_2 \rightarrow t)$

-t : $\lambda \Phi \lambda z$ [tur' (Φ)(z)] : $t \rightarrow (e_3 \rightarrow t)$

Assuming that the specification of the reflexive suffix identifies e_3 as $g(s_a)$, there is no possibility of e_1 getting identified as e_3 , because there is an intervening argument, e_2 , which would assign its reference to e_1 . This would yield 'John made p wash p', identical to a *V-REF-CAUS* sequence (the reverse of what we are discussing now). The first interpretation is therefore unavailable.

(ii) The second interpretation for (30) is unavailable for the same reason as (i) with the reference of John and x switched.

This concludes the section on the reflexive causative interaction, with all six interpretations (two interpretations for (23) cf. note 7, four for (26)) being unavailable. Reflexivisation has hitherto been analysed as a lexical process, partially due to its resistance to such processes. The analysis we have provided has the advantage of circumventing the undesirable consequence of losing the generalisation underlying this process while at the same time providing a unified account with passivisation, a process which also has the effect of argument suppression.

6.23 The interaction of passive and reflexive

6.231 Reflexive+Passive

V-REF-PASS sequences are well-formed in Turkish:

- (31) Döv-ün-ül-ür.
beat-REF-PASS-AOR
A self-hitting occurred.

The proof for (31) is straightforward:

(31')

		s_a	GOAL: $w_1:x, w_2:y, \dots w_n:z \quad f(w_1, \dots, w_n) : t$	
döv	1.	$\lambda x \lambda y [\text{döv}'(x)(y)] : e \rightarrow (e \rightarrow t)$	ASSUMPTION	
-ün	2.		IDENTIFY FIRST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS VARIABLE SUBJECT TO MOST LOCAL DISCHARGE	
	3.	CHOOSE $x = y$ $\lambda y [\text{döv}'(y)(y)] : e \rightarrow t$		
-ül	4.		IDENTIFY LAST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS VARIABLE SUBJECT TO MOST LOCAL DISCHARGE	
	5.	CHOOSE $y = g(s_a)$		
	6.	$\text{döv}'(g(s_a))(g(s_a)) : t$		
-ür	7.	CHOOSE $s_a = s_j, s_j \text{ acc to } s_{utt}$ $s_j : \text{döv}'(g(s_a))(g(s_a)) : t$ $s_j \text{ acc to } s_{utt}$		

When the reflexive is introduced, its specification identifies the internal argument with the external argument. Then the passive specifies that the external argument is to be identified with the metabox label and the proof proceeds straightforwardly.

6.232 Passive + Reflexive

We next turn to *V-PASS-REF* sequences such as:

(32) *Döv-ül-ün-ür.

beat-PASS-REF-AOR⁹

V-PASS-REF constructions are ungrammatical in Turkish, and it would be very surprising to find these in any language. The common sense reason would be that these sequences would have the same interpretation as simple *V-REF* sequences because they would mean 'John was beaten by himself'. These would only be allowed if simple passive sentences could have implicit agents coreferential with the surface subject. In

other words, one would have to assume that 'John was beaten' could have a coreferential agent as one of its natural interpretations. This interpretation is only possible, if at all, with an expressed agent. On theoretical grounds, it is impossible to show that these would have a different interpretation from *V-REF-PASS* sequences. Consider the following proof:

(32')

		s_a		GOAL: $w_1:x, w_2:y, \dots w_n:z \vdash f(w_1 \dots w_n) : t$
döv	1.	$\lambda x \lambda y [\text{döv}'(x)(y)] : e \rightarrow (e \rightarrow t)$		ASSUMPTION
-ül	2.			IDENTIFY LAST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS VARIABLE SUBJECT TO MOST LOCAL DISCHARGE
	3.	CHOOSE $y = g(s_a)$ $\lambda x [\text{döv}'(x)(g(s_a))] : e \rightarrow t$		
-ün	4.			IDENTIFY FIRST ARGUMENT OF PREDICATE $V(x_1 \dots x_n)$ AS VARIABLE SUBJECT TO MOST LOCAL DISCHARGE
	5.	CHOOSE $x = g(s_a)$		
	6.	$\text{döv}'(g(s_a))(g(s_a)) : t$		
-ür	7.	CHOOSE $s_a = s_j, s_j \text{ acc to } s_{\text{utt}}$ $s_j : \text{döv}'(g(s_a))(g(s_a)) : t$ $s_j \text{ acc to } s_{\text{utt}}$		

The result is identical with the immediately preceding proof. The only way one can bar these constructions is by stipulating that a variable cannot be identified with another variable if this latter has already picked its reference through dependency. This way the proof would have to be terminated at line 5 where the only variable available has already picked its reference through dependency.

6.3 Conclusion

In this chapter I have looked at some of the predictions of the previous analyses of causative, passive and reflexive constructions by applying them to the combination of these suffixes. We have seen that some of our predictions are borne out and that we do not need to invoke additional mechanisms for explaining the facts regarding *V-CAUS-REF* and *V-CAUS-PASS* sequences and the interaction of the passive with the reflexive. An additional finding is the application of the passive in Turkish to all immediate predicates, including the causative. This not altogether unexpected given that both the causative and the root verb have declarative content. However, I drew attention to the fact that sequences where either the passive or the reflexive are followed by the causative requires more work and I have suggested ways in which this might be pursued. In the final chapter I turn to an evaluation of certain principles of grammar with a view to investigating their role within the framework which views grammar as a reasoning mechanism.

NOTES

1. Note that we are treating nouns as proper names for purposes of simplicity, where in fact *ev* should be *ev(u)*.

2. Rosen (1990) has an example where an animate causee with *ni* (DAT) is grammatical. In such sentences the case marking on the surface subject is not *wa* but *ga*. A full analysis of such sentences would require an account of the difference between *wa* and *ga* as well as the interaction of animate/inanimate causees and case marking. We leave this to further research.

3. It is not clear how simple passives are formed in Chamorro. But one would expect both P1 and P2 because it is a dative-shift language, a factor which is related to whether it allows the passivisation of an indirect object:

(i) a. *Hu tugi' i katta para i che'lu-hu.*

1sS-write the letter to the sibling-my

I wrote the letter to my brother.

b. *In na'i si tata-n-mami nu i babui.*

1pexS-give pn father-0-our obl the pig

We gave our father the pig.

(from Baker 1988)

Notice that the oblique object in (ia) is a prepositional phrase, whereas the goal in (ib) is an unmarked direct object. (The oblique case marker belongs to *i babui* 'the pig'.)

4. See Note 1.

5. The occurrence of the accusative case marker with the passive is not a phenomenon restricted to a certain type of language and cuts across language families and types. Some Bantu languages such as Kinyarwanda (Baker 1988) and Indo-European languages such as Ukrainian (Sobin 1985) also have accusatives with passives.

6. Other differences with respect to case present themselves in Japanese. For example the causee in causatives of intransitive verbs in Japanese can have the dative case rather than the accusative case. I am indebted to Richard Ingham for pointing this out.

7. There are two instantiations of this interpretation, given that only one argument is expressible in sentences such as *John yika-t-in-di*: John made someone_i wash self_i, Someone made John_i wash self_i.

8. And in any case, this interpretation is the one which the *V-REF-CAUS* would give, in which case there would be no problem of identifying the argument labelling e_x as the dependent one.

9. This sentence can also be interpreted as a double passive due to the homophony of the passive and reflexive in this environment. An account of these has been given in section 5.3211.

CHAPTER VII

THE IMPLICATIONS OF GRAMMAR AS NATURAL DEDUCTION

7.1 Introduction

This chapter investigates certain principles and modules of GB and seeks to understand what reflex they should have in a grammar which uses the mechanisms of reasoning. In comparison to GB, the framework of LDS can be summarised as follows: a monostratal grammar which is characterised as logic. All information is projected from the lexicon which contains a variety of specifications contributing to building syntactic structure in a number of ways, including by means of their declarative content and through giving procedural information. The content of the lexicon is considerably richer in the model presented here, and lexical specifications encode various kinds of information which affect the drawing of inferences in various ways. Lexical items may also contain information relating to linear order.¹ It naturally follows that given these assumptions, certain principles which are motivated within an autonomous system of grammar (such as GB) have to be seen in a different light; it might be expected, for example, that some lose their status as independent principles simply because they follow from general principles of logic. In section 7.2 I shall focus on the principles relevant to the representation of argument structure: section 7.21 will investigate the status of the Projection Principle in a monostratal grammar, in section 7.22 I shall look at Theta Theory and the status of Θ -roles, and in section 7.23 shall evaluate Case Theory. The Mirror Principle (Baker 1985) will be analysed in section 7.24 finally in section 7.3 I shall look at the notion of configurationality. The arguments in this section are based on GB analyses pre-dating the minimalist theory of Chomsky (1992) which may have considerably different implications for the nature of the principles in question.

7.2 An evaluation of some principles and modules of Universal Grammar

7.21 The Projection Principle

The Projection Principle, one of the cornerstones of GB, embodies the requirement that

lexical information projects onto syntax. The Projection Principle consists of two clauses: (i) that subcategorisation properties of lexical items are realised in syntax, and (ii) that they are present at all levels of representation (Chomsky 1981). Naturally, some mechanism guaranteeing the projection of lexical information is necessary for all grammars, and the first clause of the Projection Principle would have to be stated in every grammar having a lexical and a syntactic component. In the framework of LDS an even more inclusive version of the Projection Principle is essential because lexically specified information is responsible for the projection of structure through control specifications, database labelling devices and instructions on goal specification, all of which have to be syntactically represented. The first clause of the Projection Principle is therefore a requirement of the LDS framework.

The second clause of the Projection Principle turns out to be a theory internal requirement for GB. The presence of subcategorised elements at all levels is the primary factor guaranteeing the presence of traces, where the most deeply embedded trace is in a position required by the Projection Principle.² In other words if there were no second clause of the Projection Principle movement would be unconstrained, because the E(mpty) C(ategory) P(rinciple), one of the constraint on movement, is formulated in terms of the well-formedness conditions on traces. This part of the Projection Principle thus provides the basis for the link between D-structure and S-structure³ and as Kempson (1988a) points out, should D-structure be taken to lose its force, the part of the Projection Principle which underlies trace theory is much undermined. It is also pointed out in Chomsky (1981) that the Projection Principle plays a pivotal role in setting out the well-formedness conditions imposed on trace theory. That the presence of the ECP necessitates the Projection Principle is mentioned in Chomsky (1981, p.32) who states that this principle is "far from innocuous. It is violated...by any theory that does not incorporate something similar to trace theory. It is also violated by most approaches that incorporate trace theory, e.g. the O(n)B(inding)-theory, with its "structure building rules."⁴ Whether movement takes place, is, then, directly linked to

the satisfaction of this condition, the ECP, which is itself defined over elements whose existence is linked to the Projection Principle.

The Projection Principle has been argued to be problematic especially in the analysis of complex predicates (Marantz 1988). The particular problem Marantz mentions is the incompatibility of the standard version of the Projection Principle with properties displayed by surface representations. Marantz' arguments which favour an underlying biclausal representation for causative constructions while at the same time maintaining a monoclausal surface representation raise the question as to how the Projection Principle is to be sustained given the mismatch between these levels.⁵ This suggests that a weakening of the Projection Principle is required.

There is no requirement of identical structure in representations in the framework of LDS. Argument structure is projected from the lexicon, but the projected structure does not have to be isomorphic with the surface string. Arguments may be optional (depending on language particular phenomena) and they may be ordered in a number of ways with respect to each other. However, arguments are syntactically present, and they enter the combinatorial mechanism. Notice that in the framework of LDS there is a three-way notion of order and structure: the order of the lexical items in the surface string, the order in the database (for example, adverbials can be in the database label irrespective of their surface position), and order of arguments reflecting combination as encoded in lexical specifications, with no requirement for isomorphy. With respect to the Projection Principle, then, the first clause requiring the projection of lexical information is maintained in a more generalised fashion in the framework of LDS, that is by including all syntactically relevant specifications, but the second clause requiring isomorphy in some form is abandoned.

7.22 Θ -roles and Theta Theory

Before turning to Theta Theory I would like to look at the status of Θ -roles in the

theory of grammar. Θ -roles are not an integral part of the GB framework, only occurring in descriptions of argument structure and in the formulation of the Θ -criterion. I shall nevertheless briefly investigate their status, as they play a significant role in the evaluation of argument structure in works written in other frameworks, such as Lexical Functional Grammar.

The following points are relevant to the nature and distribution of Θ -roles: (i) the requirement that Θ -roles have to be assigned to arguments comes from the lexicon where predicates have subcategorised s-selection properties, such as goal, beneficiary, theme, and others, (ii) unlike in other frameworks such as LFG, Θ -roles in GB are not subject to an internal hierarchy⁶ (cf. Bresnan and Kaplan 1982, Bresnan and Kanerva 1989, and also Grimshaw 1990 for a modified analysis of Θ -roles), (iii) each Θ -role is associated with a syntactic category which is its C(anonical) S(tructural) R(ealisation), which in turn obviates the need to subcategorise predicates for syntactic categories, and (iv) a Θ -role is assigned to an argument only if that argument is visible for case. We take each point in turn.

(i) As demonstrated by Dowty (1989, and references therein), role types are elusive as coherent entities, with the agent/patient opposition being the only pair which might hold to scrutiny, and there is every reason to assume that they are not part of grammatical descriptions (Ladusaw and Dowty 1988). Dowty (op cit.) also argues that there is a minimal amount of semantic complementarity between certain Θ -roles such as beneficiary and recipient. The data in the present work lends support to the view that there is no empirical evidence for assuming that Θ -roles play a part in grammatical representations. At no stage have they needed to be invoked, and this being the case, stating the s-selection properties of predicates in terms of these entities does not serve the purpose of describing the distributional properties of arguments. The view which we have defended so far is that Θ -roles have no tangible status in grammar, and the differences that have been attributed to differences in Θ -roles are stateable as differences

ensuing from idiosyncratic properties of predicate (such as the +human restriction in sections 4.33 and 5.3211). Similar views are held by Hoekstra (1984), Levin and Rappaport (1986), Booij and van Haaften (1988), Lieber (1992), and others.

(ii) Since it is not possible to define Θ -roles, the only way to attribute them any status would be in terms of distinguishing them relative to one another (as for example in Grimshaw 1990). Therefore, it does not make sense to say that a certain verb subcategorises for one Θ -role, whereas another one subcategorises for another, when there is no means of distinguishing between the two.

(iii) For the same reason, it is not possible to say that a Θ -role corresponds to a specific category, that is, a CSR.

(iv) As for the positions to which Θ -roles are assigned, the non-distinction between Θ -roles does not lead to an immediate disadvantage in GB.⁷ They are assigned, irrespective of what they are, to A-positions, these being positions where grammatical functions (such as subject and object) are realised as a consequence of the Projection Principle. Assigning a Θ -role to a specific position is also a theory internal requirement: in a system like LDS where structure is built up as a procedure, the position where an argument is to occur is part of the lexical specifications.

After this brief exposition of the status of Θ -roles I turn to Theta Theory which is the module that regulates the distribution of arguments. The constraint that guarantees the well-formedness of argument structure is stated as the Θ -criterion:

- (i) Every argument is assigned one and only one thematic role,
- (ii) Every thematic role must be assigned to one and only one argument.

Both parts of the Θ -criterion are directly translatable into LDS terms if we make a shift regarding the level at which it applies. Once we assume that the relevant level is not the surface string or any level corresponding to it, we can rephrase the Θ -criterion as (i) the constraint requiring all minor premises to be used, and (ii) not to be used more than

once. The former constraint corresponds to the first clause of the Θ -criterion and the latter corresponds to the second clause. Notice that it then turns out to be a condition on the appearance of a minor premise as a step in Modus Ponens; in other words, once a premise projected from an argument is used as a step in the combinatorial process, it cannot be used again. And once a premise appears as part of the argument structure of a predicate in the database, it has to be used, due to independent properties of the logic, otherwise a well-formed formula of type t cannot be achieved. Indeed the two properties of uniqueness and obligatory saturation are definitional of linear logic. Valid inference involves a set of premises, each of which ought to be used once and only once. Notice that stating the Θ -criterion as a condition on proofs has certain advantages. It first of all, seems to obviate a problem mentioned by Higginbotham (1985) concerning the adequacy of second clause of the Θ -criterion. Higginbotham mentions the (sometimes obligatory) absence of the representation of certain thematic roles such as the one assigned to the logical subject of a passive. Notice that Higginbotham's characterisation refers to the representation of S-structure. In our characterisation of the passive, although this argument does not appear in the surface string, it is nevertheless "used" by the passive, and its presence as the target of the control specification of the passive is obligatory. One could similarly criticise the Θ -criterion as falling short of accounting for optional arguments in some languages. Hence, as Kempson (1988a) argues, the Θ -criterion is at best operational at a logical level. Higginbotham's view, namely that a Θ -role must be discharged (i.e. closing a structure with respect to a Θ -role, in other words saturating a predicate with its Θ -roles) can then be reformulated as a condition on the well-formedness of a logical proof: the logic of LDS would require each argument to be used at the level where inferences are drawn. Since the underdetermined nature of natural language syntax is taken as a starting point, it is not surprising to have non-overt elements which are recovered through pragmatic means. Thus non-overt elements can be used in the proof without resorting to additional stipulations. We therefore conclude that the content of the Θ -criterion is directly translatable into constraints regulating the proof in the framework of LDS.⁸

7.23 Case Theory

The final well-formedness condition in GB that we will be dealing with involves case marking. I discussed the shortcomings of a specific extended version of case theory (the case insertion rule) in sections 1.212 and 1.213, where I argued that adding a specific rule to account for the cases of causees made Case Theory too strong. Here we shall look at some of its fundamental characteristics.

Although there are various accounts regarding the nodes which assign case and the positions to which case is assigned⁹ there is little disagreement about the role of structure and government in case assignment, following Stowell (1981). Case Theory can be summarised briefly as follows. A case has to be assigned to every NP (either a phonetically realised one or one which is empty, more precisely, to the chain containing it¹⁰) in order for that NP to be "visible" for Θ -marking. Case can be assigned in two ways: either "inherently", that is, at D-structure linked to a Θ -role, or "structurally", that is at S-structure under certain configurational conditions. The most important point, and the one which is most relevant to the discussion here is the link between Case Theory and Theta Theory manifested in the "visibility condition". The formulation which requires an NP to be in a case marked position in order to receive a Θ -role (cf. Chomsky 1986b) carries the disadvantage of making Θ -role assignment dependent on structural conditions. The reason why this is undesirable is because it weakens the reasons behind base generating NPs in the positions where they are base generated in the first place: if they cannot receive a Θ -role in these positions, what makes these positions Θ -positions? This seems to imply that the Θ -roles assigned at D-structure need to be reassigned later in case marked positions. And if NPs require case marking in order to be realised, why does this have to be reduced to a requirement linking case marking to surface positions?

Among the works questioning a strong correspondence between case marking and surface positions is Borer (1983). Basing her suggestion on data from Romance

causatives, she suggests that case is an operation on lexical entries and that the dative is associated with the second slot (in the argument structure of a causative), as a consequence of the lexical properties of the verb. Hence verbs are subcategorised for case, a position held in earlier work (cf. Fillmore 1968, Stowell 1981). But in Borer's account too, there is a correspondence between a case and a thematic role, which, for example, in the case of the dative case marker is the goal.

There is no doubt that there is a link between case and argument structure. However, the problem seems to get complicated both by resorting to Θ -theory instead of retaining the intuition that arguments are elements which saturate predicates, and by taking case to be definable over pre-set positions (in the X' schemata) rather than taking it to encode instructions for building up structure. As we have seen in sections 4.32 and in Chapter VI, a natural way to capture the link between argument structure, which is a configurational notion, and case marking, which is a surface phenomenon, is to state the property of each case marker as directing the premise projected from an NP to a specific point at which it has to enter the derivation combinatorially. Each predicate has a specific number of arguments and each argument requires case in order to enter the combination. Such a characterisation of case corresponds more to the earlier version of case theory which incorporates a Case Filter. The Case Filter requires each phonetically realised NP to have case in order to be visible (which was later replaced by the visibility condition). Our characterisation of case marking trivially incorporates this filter. An NP has to occur somewhere in the logical derivation, and the only way this is possible is either through case marking, through word order or through prosodic phenomena (cf. Chapter III). Incidentally, this aspect of case marking has not gone unnoticed either. Although many attempts have since been made to weaken case theory in favour of accommodating non-configurational languages, (to my knowledge) the first breakdown of the structural adjacency requirement (among research in GB) appeared as early as Stowell (1981). Also within Lexical Functional Grammar, it was around the same time that the near complementarity of overt case markers in non-configurational languages

and case marking positions in configurational languages was recognised (Mohan 1982).¹¹ Stowell argued that there were two kinds of case assignment depending on configurationality. One was structural case assignment, and the other was subcategorisation for case. The former depends on adjacency as a condition on government, but the latter, as is the case with languages that have overt case markers, is defined as part of the lexical specifications of verbs. This is significant, because the requirement to characterise case marking as subcategorisation leads to an overlap between case and argument structure. Although we are not claiming that for each argument of a predicate there is a specific case-marker, we are certainly claiming that in cases where there is no ambiguity, each argument either bears a case-marker or appears at a specific position in a linear string (and in some cases both), otherwise its position is signalled by stress or intonation. In fact, Stowell's position supports the observation that there are two ways the interpretation of an argument can be established (case-marking and word order), but the efforts to unify these in terms of government not only complicate the assignment of case considerably but also obscure the function of case marking.

Structure building is of course only one function of case marking. Cases also mark adjuncts in Turkish. In the framework of LDS cases marking adjuncts are characterised as functions mapping argument types onto adjunct types, hence such case markers have the specification $e \rightarrow ((e \rightarrow t) \rightarrow (e \rightarrow t))$, a point we discussed in Chapter IV.

7.24 The Mirror Principle

We now turn to a principle involving the structure of complex predicates. I mentioned in section 2.236 and later in Chapter VI that the fulfilment of logical specifications in Turkish respects the order in which morphemes occur, and that a derivational suffix takes as input the output of the immediately preceding morpheme. In other words I claimed that configurational properties induced by the morphemes under scrutiny run parallel to their concatenative (surface) properties and added that this was a trivial

property of Turkish and should not be generalised as a universal principle. However, contra these assumptions, It has been claimed that this is a universal property of complex verb formation generalised as the Mirror Principle by Baker (1985). The Mirror Principle states that syntactic derivations must reflect morphological derivations, and vice versa, hence it asserts that, in our terms, configurational and concatenative processes are simultaneous. We shall see below that this is not the case. The fact that word-internal concatenative and combinatorial processes unfold concurrently in Turkish and indeed in many other languages can only be a result of functional effort reducing processes of a more general nature, and some languages simply do not display this functional characteristic. In other words the facts in Turkish are merely of descriptive value and cannot be taken to follow from a principle of grammar per se. In this section I shall focus on whether a direct mapping between morphology and syntax as implied by the Mirror Principle could be considered a principle of grammar, irrespective of its empirical adequacy. I shall not be suggesting an alternative proposal for word formation at this stage as this is a topic which falls outside the scope of the present work. The purpose of this subsection is merely to show that the Mirror Principle is untenable on empirical grounds, and that theoretically it reflects the unfounded assumption that rules of word formation can directly be subsumed under rules of clause formation.

One of the prime examples for the Mirror Principle comes from Quechua where the order of morphemes directly predicts the interpretation of multiple derivational morphemes. (Examples are from Baker 1985 unless indicated otherwise.)

Quechua

- (1) a. Maqa-**naku**-ya-**chi**-n.
beat-REC-DUR-CAUS-3
He_i is causing them_i to beat each other_i.

- b. i. beat
- ii. beat-rec: [x beat y & y beat x]
- iii. beat-rec-caus: z cause [x beat y & y beat x]

- (2) a. Maqa-**chi-naku-rka-n**.
 beat-**CAUS-REC-PL-3**.
 They_i let someone_j beat each other_i.

- b. i. beat
- ii. beat-caus: [x beat-cause y] = [x cause someone beat y]
- iii. beat-caus-rec: [[x cause someone beat y] & [y cause someone beat x]]

The (b) examples explicitly show the order in which the reciprocal and causative suffixes have combined to get the different interpretations. Similar facts hold for the interaction of grammatical function changing morphemes and agreement, as displayed in Chamorro:

Chamorro

- (3) a. Para-u-**fan-s-in-aolak** i famagu gi as tata-n-niha.
 IRR-**3S-PL-PASS**-spank the children by their father.
 The children are going to be spanked by their father.

- b. i. spank (the children)
- ii. PASS+spank: (the children) be spanked
- iii. PL+PASS+spank: [[be spanked] PL]

- (4) a. Hu-**na-fan-otchu** siha.
 1S-**CAUS-PL**-eat them.
 I made them eat.

- b. i. eat
- ii. PL+eat: they eat
- iii. CAUS+PL+ eat: [x CAUS [they eat]]

In (3a) the plural morpheme which marks subject agreement refers to the subject of the immediately preceding element which is the passive, as (3biii) indicates. Again in (4a) the plural *fan* agrees with the subject of the immediately preceding element which is *otchu* 'eat' and not with the subject of the causative which is outside it. Such data form the basis for generalising these observations into a principle which is, by claim, universal; a principle whereby syntactic and morphological derivations occur simultaneously. If the basic insight of the Mirror Principle is to be retained, the prediction is that there is no word which displays the sequence $x+y+z$ but has the combinatorial properties of, say, $x+z+y$.

Before considering the counterexamples, a point about the scope of the Mirror Principle should be clarified. (1) and (2) show the interaction of two grammatical function changing affixes, and in (3) and (4) a grammatical function changing affix interacts with agreement, standardly an inflectional affix. The question remains as to whether the Mirror Principle applies to inflectional morphology as well. On the one hand, the commitment to a non-distinction between inflectional and derivational morphemes is essential if the Mirror Principle is to be sustained, because in Baker's model there is no separate word formation component, and all derivations take place in the syntax. Moreover, inflectional morphemes are not excluded in the formulation of the Mirror Principle. On the other hand, Baker's examples contain inflectional morphemes only when they interact with derivational morphemes. Although this does not entail that they are excluded, one nevertheless wonders how it would be possible to accommodate inflectional morphology into the framework. Consider the following sentences from Turkish:

- (5) a. *Gid-iyor-lar-dı.*
 go-ASP-PL-TNS
 They were going.
- b. *Gid-iyor-du-lar.*
 go-ASP-TNS-PL
 They were going.

Swapping the tense and agreement morphemes yields no interpretive difference in such sequences. Cross-linguistic data provides similar evidence:

Berber

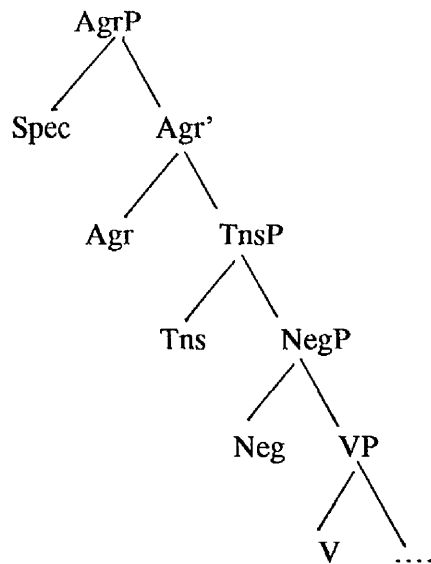
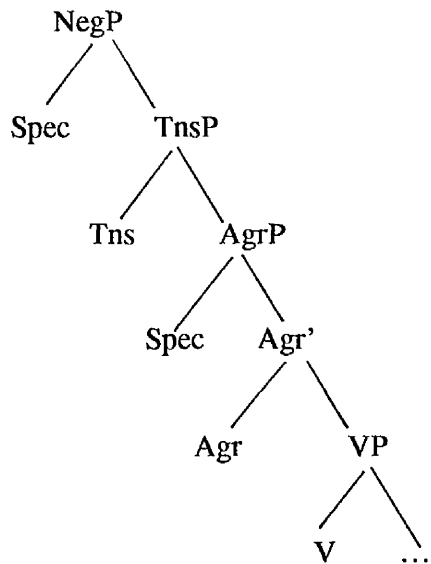
- (6) a. *Ur-ad-y-xdel* Mohand *dudsha.*
 NEG-FUT-3-arrive tomorrow
 Mohand will not arrive tomorrow.

(From Ouhalla 1990b)

Turkish

- b. Mehmet *yarın* *gel-me-(y)ecek.*¹²
 tomorrow arrive-NEG-FUT-3
 Mehmet will not arrive tomorrow.

In the Berber example the sequence of the affixes is V-AGR-TNS-NEG, whereas in Turkish it is V-NEG-TNS-AGR, two completely different orders with a single interpretation. Hence in (5) and (6) we find discrete morpheme orders which give the same interpretation. In this case what does the Mirror Principle predict? What does it mean to say that morphological derivations reflect syntactic derivations? Ouhalla (1990b) suggests that it predicts the difference between the phrase structures of Turkish and Berber given below:

(7) a. *Turkish*b. *Berber*

When head movement applies, (7a) and (7b) provide the results displayed by the consecutive words. However, it is not conceivable that the Mirror Principle would spell out the syntactic structures corresponding to complex words in these cases. This would mean that different morpheme sequences would have different syntactic representations even though their interpretation is identical. Recall that the power of the Mirror Principle, if any, comes from capturing syntactic differences insofar as they have observable semantic manifestations, and the relation of these to sequences of morphemes. What this principle sets out to predict is that the differences in *interpretation* between sequences is an outcome of the linear order of the morphemes. This is supposedly why (1a) does not mean (2a). (Whether they could have had the same interpretation is a different matter to be investigated subsequently). Applying this intuition to the pairs in (5) and (6) is meaningless simply because there is no way in which we can prove or disprove that the syntactic properties of tense apply before negation in Berber, but after in Turkish, in the way that we can show that grammatical function changing morphemes trigger syntactic processes in a stepwise fashion. Hence the phrase "syntactic derivation" in the formulation of the Mirror Principle can only be

interpreted as the set of syntactic derivations which alter argument structure. Conversely, if the Mirror Principle were to be interpreted as applying to inflectional morphology as it does to derivational morphology, then the Berber and Turkish sentences should have different interpretations. But they do not.¹³ Thus, including inflectional morphology in the Mirror Principle allows it to apply vacuously.

We now turn to the evaluation of the Mirror Principle in terms of what it sets out to explain: the order of derivational morphemes predicting the order of syntactic combinations. Among the many counterexamples to the Mirror principle, we shall give a few. One piece of evidence which was put forward in support of the Mirror Principle was the following:

Quechua

- (8) a. Hu-na-fan-otchu siha.
 1S-CAUS-PL-eat them.
 I made them eat.

the sequence being $V^i\text{-AGR}^i\text{-CAUS}^k\text{-AGR}^k$, where each agreement suffix is co-superscripted with the verbal particle of which it is the logical subject. The same interpretation in Turkish however is not expressed by an identical sequence as in (9b), but as in (9a):

- (9) a. Ye-dir-di-m onları.
 eat-CAUS-PAST-1 them
 I made them eat.
- b. *Ye-ler-dir-di-m onları.
 eat-PL-CAUS-PAST-AGR them

In parallel to (8), one would expect (9b) to be the grammatical version. (9a), on the other hand, lacks the highlighted section in $V^i\text{-AGR}^i\text{-CAUS}^k\text{-AGR}^k$. This violates the second clause of the Mirror Principle which says that syntactic derivations are reflected in morphological derivations. If this were the case, morphological gaps of the kind in (9a) would have been disallowed, because a syntactically present element, the logical object of the root verb, is not reflected in the morphology. Similarly, a sequence such as the one given in (10a) from Sliammon, a Salishan language, should be grammatical in Turkish as well if morphological and syntactic derivations mirror one another. But as (10b) illustrates, this is not the case, and the grammatical sequence is (10c):

Sliammon

- (10) a. sêp'-t-si-êm
club-TR-2-INTR
You are clubbed.

(From Davis 1980)

Turkish

- b. *düş-ür-sün-ül-dü
fall-CAUS-2-PASS-PAST
- c. düş-ür-ül-dü-n
fall-CAUS-PASS-2-PAST
You were dropped.

Another piece of evidence against the Mirror Principle is sequences such as the following:

- (11) Ye-dir-dik-ler-im...
eat-CAUS-COMP-3PL-1
(the ones) such that I made them eat

Notice that when we do get agreement of the logical subject of the causative, we do not get the sequence $V^j\text{-AGR}^i\text{-CAUS}^k\text{-AGR}^k$ as predicted above, but $V^j\text{-CAUS}^k\text{-COMP-AGR}^k\text{-AGR}^j$. There are numerous other examples from various languages.¹⁴

The problems we have been discussing relate to the Bakerian version of the Mirror Principle which maps the observable surface order of the morphemes onto syntactic processes. I shall call this "the stronger version". The "weaker version" maintains that the linear order of the morphemes is a superficial manifestation which obscures the underlying order in which they are concatenated, a view held by Alsina (1990). The significant difference between these views is that the counterexamples to the stronger version cease to be problematic in the weaker version because linear ordering loses its power. It is no longer indicative of the order of concatenations because the point at which a morpheme attaches to a stem need not necessarily be the point at which it appears in the string. An example from Alsina (attributed to Hyman (1990) illustrates the point:

Kinande

- (12) a. -tsap 'get wet' (intransitive)
 b. -tsap-i- 'wet' (transitive)
 c. -tsap-an-i 'wet each other'

(From Hyman 1990 cited in Alsina 1990)

The reflexive suffix *-an* can only combine with transitives, therefore it should attach to (12b), whereas it attaches to the root. Since it is inconceivable for a reflexive to combine with an intransitive stem, it must be the case that it attaches afterwards, with the effects being phonologically invisible. This is because among the properties of *-i*, there is one that dictates that it be the last in a phonological string, a point which can be further illustrated by sequences where the root itself is bound:

- (13) a. *-song-
 b. -songi- 'gather' (transitive)
 c. -song-an-i 'gather each other'

(From Hyman 1990 cited in Alsina 1990)

Since there is no form *song*, the reflexive cannot attach to it. It therefore attaches to (13b), but again the transitivising suffix has to appear last. Hence in forms such as (12) *-i* attaches first with both its morphophonological and syntactic/semantic properties. However, as its morphophonological property is that it should not be attached until a certain stage, this property is fulfilled, and it attaches last.

It is not very clear how even the weaker version of the Mirror Principle would account for certain morpheme orders. Consider the following:

Kinande

- (14) -hum-ir-an
 hit-APP-REC
 (i) hit X for each other [V-APP-REC]
 (ii) hit each other for X [V-REC-APP]

The stronger version of the Mirror Principle would superficially predict (14ii), an applicativised reciprocal to be expressed by the sequence **-hum-an-ir-* which is ungrammatical. The explanation given by Alsina focuses on how it is possible to have two interpretations for (14) in some languages, but only a single interpretation in others, a property he attributes to typological differences in object properties, including thematic properties, factors which are not taken into consideration in the formulation of the Mirror Principle. While it is understandable that such factors would affect the type of object that would be allowed to replace X in (14) such that it could equally be replaceable by a beneficiary or a patient, or only by a patient (depending on the language), it is not clear how this would lead to two interpretations, namely, (14i) and

(14ii).¹⁵ Object properties do not seem to be sufficient in explaining how a sequence can have two interpretations, but more importantly, they are irrelevant to the issue as to why a certain interpretation does not have the expected morphological sequence.

The basic idea that Alsina defends is that violations of the stronger version of the Mirror Principle are actually consistent with a slightly different interpretation of the Mirror Principle. His suggestion that the order in which morphemes concatenate is not always visible in the actual string appears to be further supported by nonconcatenative and template morphology.

A final counterexample to the weaker version of the Mirror Principle is the so-called *-ku* deletion cases of Quechua argued for by Muysken (1988). Although the exact content of this suffix is not clear, it appears to be a reflexive suffix which identifies the arguments introduced by a reciprocalised verb. That is, in order to get an interpretation such as 'They see each other', this suffix is required as well as the reciprocal:

- (15) Riku-na-ku-n-ku. (*Riku-na-n-ku.)
 see-REC-REF-3-PL
 They see each other.

What interests us here vis-a-vis the Mirror Principle is that when (14) occurs as the complement of a causative affix, *-ku* cannot be present, although it would seem that whatever requires it to be present in (15) would also require it when it is a complement of the causative construction:

- (16) *Riku-na-ku-chi-n.
 see-REC-CAUS-3
 (Intended reading: He caused them to see each other.)

If, as Muysken argues, these are cases of morpheme deletion then one would need a means of accounting for the phonological absence of a morpheme which is, by claim, nevertheless present semantically.¹⁶

The claim that linear order conceals certain properties of lexical items is, of course, a position that we have held in this work, especially with respect to the data that gives rise to bracketing paradoxes. But we cannot conclude from this that (either version of) the Mirror Principle holds. It should be noted that in the stronger version the phrase "morphological derivation" refers again, to the *observable* linear order of morphemes, i.e. to the phonological string. It then becomes quite difficult to consider the weaker version of the Mirror Principle as *a possible* version of the Mirror Principle when morphological specifications are permitted to include instructions about the order of concatenation. It seems that interpreting such cases as manifestations of the Mirror principle is forced by the requirements of models in which all properties of lexical items have to be fulfilled in one fell swoop (cf. Grimshaw 1986, Alsina 1990). These models rely on a single derivation with both kinds of effects. Otherwise these would all fall into the realm of non-isomorphic representations, something which none of the above models can accommodate. Hence the difference between Baker's view and Alsina's view turns out to be a distinction between where the Mirror principle takes place. Baker argues that it is a syntactic principle, while Alsina claims that it takes place in the lexicon.

Attractive though it may be to formulate observations relating to morphological and syntactic phenomena as a universal principle, the data at hand readily lend themselves to an alternative interpretation. Even if the empirical adequacy of the Mirror Principle were beyond doubt, it would not follow from this that a principle as such were warranted. The observation that for every morpheme sequence x - y all properties of the morpheme x precede those of y does not necessarily lead one to state this as a language internal requirement. Simultaneous derivations in morphology and syntax may very well be due to a functional mechanism which aims at reducing the processing burden of the

cognitive system. In fact, the counterexamples to the Mirror Principle are just one of the indications that simultaneous derivations are the work of a functional mechanism rather than a principle. The other indication is that nowhere else in the grammar do we find such perfect simultaneity. Hence the fact that the derivational morphemes we have been looking at happen to conform to the Mirror Principle only indicates that there is a tendency, probably in the deductive mechanism, to derive properties of lexical items simultaneously. However, there is also a mechanism which "delays" the fulfilment of certain properties, as the examples by Alsina perfectly illustrate. It is this that the Mirror Principle fails to account for. The main difference between deriving the Mirror Principle from a grammar-internal requirement and attributing it to a functional mechanism is that the latter could accommodate the counter-examples, if any, but the former cannot. There is no a priori reason to assume that a correspondence of morphological and syntactic derivations follows from a property of Universal Grammar. In fact, if anything, a grammatical model will require mechanisms to postpone the fulfilment of certain properties rather than fulfilling them simultaneously. In the framework of LDS sequential projection and semantic compilation are characterised separately. As a result, representing such mismatches can be achieved directly.

This suggestion is supported by the fact that some morpheme sequences in languages conform to the descriptive content of the Mirror Principle but others violate it. It is more likely that derivational morphology should conform to it because considering that these morphemes change grammatical functions, it would be unduly burdensome to interpret them if the order were the reverse of expectations. But this does not mean that the reverse order is impossible, as examples from Kinande in (13) very well show. As a conclusion, the Mirror Principle is at best a descriptive device highlighting functional mechanisms which may at times be overridden by language particular constraints.

7.3 Configurationality

We have systematically used the term "configurational" to refer to combinatorial aspects of a construction and not to aspects of surface order which are definable in terms of linearity. The present work takes the disjunction between linearity and configurationality as a fundamental property of linguistic structure. The interpretation of utterances depends on the interaction between the effects of linearity and hierarchy relations, but in order to understand the mechanisms of such interaction, the two notions must be analysed in isolation from one another. Since the term "configurationality" has been used in various ways in recent linguistic research, often subsuming concepts which fall within the domain of linear order, I would like to present a brief review of the relevant discussions.¹⁷

The term configurationality was granted theoretical status in the recent literature through a number of papers written by Hale (1983 and references therein). Based on his study of Warlpiri, Hale suggested that the phrase structure of certain languages did not conform to the standardly assumed X' format. These languages which he called non-configurational (abbreviated as W*) had, in varying degrees, relatively free word order and discontinuous constituents, null elements, no movement at S-structure, a rich case system, complex verbs (including modal elements) and they lacked pleonastic elements. Hale suggested that W* languages had flat structure only at the Phrase Structure level - the level where syntactic structure is represented. But at the level where predicate-argument structure was represented (Lexical Structure), they displayed strict hierarchy with the familiar subject object asymmetries. Languages were parameterised with respect to configurationality such that some (so-called configurational languages) had structural hierarchy at both levels, whereas others (non-configurational languages) only at Lexical Structure.¹⁸ In short, Hale accepted structural hierarchy as a universal phenomenon; but what he referred to as configurationality was the property of having a hierarchical structure at Phrase Structure, a level relatively similar to S-structure.

The structural discrepancy between the levels of representation in non-configurational languages is actually difficult to reconcile with some of the subtheories assumed to be part of universal grammar. These are the Projection Principle and Case Theory. The problem for the Projection Principle is this. Recall that in GB the Projection Principle states that lexical structure is represented at all levels; such representations, by definition, imply that there is a hierarchy within which arguments are represented. However, non-configurational languages simply ignore this fact. This point is recognised by Chomsky who argues for a "slight reinterpretation" (cf. Chomsky 1981, p. 133) of the requirement that the Projection Principle be satisfied at all levels (in non-configurational languages). This reinterpretation involves a reformulation of the dependency between D-structure and S-structure: they are to be interpreted as pairs (α , β) with the Projection Principle satisfied as long as it refers to at least one element of the pair. This, of course, is a considerable weakening of the Projection Principle. A similar view is given by Hale: in configurational languages the Projection Principle holds of the pair Lexical Structure/Phrase Structure, but in non-configurational languages it holds of Lexical Structure only (because arguments are optional at Phrase Structure).¹⁹

The problem concerning Case Theory is as follows. Structural case is assigned at S-structure under government. Since non-configurational languages by definition have symmetric positions for objects and subjects at S-structure, there is no way of guaranteeing that the object receives accusative case rather than, say, the subject. The solution which Hale proposes is that all cases are assigned at Lexical Structure where government relations hold.²⁰ But this creates yet another problem, this time with passive constructions. Recall that the motivation for movement at S-structure comes from the requirement for visibility: an (object) NP is forced to move in passive constructions to receive case. However in non-configurational languages case is presumably assigned at D-structure, and therefore there is no motivation for movement. Now if the passive morpheme absorbs case, what is it that assigns case to the subject

in passive constructions given that there is no movement? Notice that in configurational languages it is the INFL that does this job at S-structure under government, an option which is not available in non-configurational languages.²¹ In order to account for the fact that subject NPs in such languages are not left without case, Chomsky suggests a rule 'Assume a G(rammatical) F(unction)', this being the analogue of the movement transformation. This way grammatical functions are assigned to NPs apparently at random and it is not obvious what guarantees that nominative case is assigned to the subject (rather than, say, dative case). Chomsky states that it is possible "...to narrow the procedure outlined in various ways to ensure more rapid convergence on the appropriate D- and S-structures, eliminating the random elements and providing an algorithm of some sort for making the right choices, given surface structure. We now have a parsing model, in effect." (Chomsky 1981, p. 135).

There is no doubt that the debate over configurationality has provided invaluable insights about some aspects of the structure of language which might otherwise have gone unnoticed.²² However this particular way of addressing configurationality is limited by theory internal considerations relating to a multistratal syntax, because it takes configurationality as a notion describing S-structure. What have been observed as characteristics of languages in the configurationality debate are not totally new observations. It has been assumed all along, by syntacticians and formal semanticists that languages display structural hierarchy. It was also known that the properties mentioned above, such as free word order, discontinuous constituents and rich inflectional paradigms were factors that distinguished languages typologically. What was new in Hale's work was the effort to reconcile these facts with the theory of grammar assumed in GB.

Our notion of configurationality and its relation to the characteristics distinguishing languages is quite straightforward: we assume, with everyone else, that the structure of language is highly configurational. This is a general trait of the

reasoning device, which is formalised as a logic, hence it does not have to be specifically stated. As for the characteristics which distinguish languages typologically, free word order and discontinuous constituency are notions relating to linearity which has nothing to do with hierarchy. Conflating the notions of linearity and hierarchy under a single parameter, as it is the case with the configurationality parameter can at best be described as a shortcoming ensuing from theory internal considerations. Theoretical frameworks lacking a format in which to characterise linear order are bound to conflate linearity with hierarchy. A framework such as LDS has mechanisms for characterising the two notions separately: linearity is partially definable as the order of information entering the database and configurationality as the combinatorial function-argument application. Structural nodes such as that corresponding to the VP which are generally taken to be indicative of configurationality at S-structure are the product of such function-argument application. This is the result of the combination of the premises and is stated independently of the linear order of the surface string. We leave it to further research to exploit the possibilities presented by this disjunction to the full extent.

7.6 Conclusion

In this chapter I looked at certain principles and properties of Universal Grammar with a view to understanding their status within a reasoning logic. It was suggested that the projection of lexical information is an even stronger requirement in the framework of LDS, and that the Θ -criterion applies to premises projected from arguments rather than to arguments at a surface level as a defining property of such a logic. An altogether different account of case was given in Chapters IV and V, and here certain aspects of Case Theory were discussed for comparison. I have suggested that the Mirror Principle is at best a descriptive device and as such does not accommodate the diversity in word internal morpheme order.

In this work I have analysed a small number of construction types within a newly emerging model that characterises linguistic content as a process of natural deduction.

Many aspects of the framework need to be given full formal content before the possibilities it presents are fully understood and exploited. I hope to have shown that there is sufficient reason for undertaking such a task and for considering it a challenging alternative to characterising language.

NOTES

1. This is suggested in Gabbay and Kempson (1992a). They argue that linear order may be encoded in the lexical properties of certain items, for example, transitive verbs in English can be taken to contain the information requiring the item preceding them to be the subject. Such a shift toward a broader concept of lexical property is also suggested by Chomsky (1991b), where he states that heads probably include, as a lexical property, specifications relating to directionality of canonical government.
2. The Projection Principle is, for some researchers, the only motivation behind the presence of D-structure. See arguments in Speas (1990) regarding D-structure as a pure representation of thematic structure.
3. The role of the Projection Principle in alternative approaches within GB is much the same in principle. The view that treats LF as the input to syntactic derivation containing chains, and positing D-structure as a derived level containing all and only Θ -positions (cf. Brody 1985) requires the Projection Principle as well. In this approach movement takes place within chains, again requiring the traces to be properly governed.
4. We assume here that the reference is to the second clause of the Projection Principle.
5. In particular, Marantz proposes an extension to the Projection Principle: if there is a relation R between two constituents at one level, this must map onto a relation R' between corresponding constituents at another level (where 'corresponding' is to be made explicit in the theory).
6. This generalisation holds with a few exceptions such as Belletti and Rizzi (1988) who argue that the experiencer is always in a higher position in a tree.
7. There are also attempts to assign each Θ -role to a unique position in a phrase marker (cf. Belletti and Rizzi 1988, Larson 1988). Although bearing certain advantages, the inadequacy of such analyses follow from what we have been arguing to be vague entities. It is also a fact that once a Θ -role is assigned a specific base position in a tree, the restrictedness of X' structure is jeopardised, and the move towards abandoning the

categorial component is this time replaced by a similar redundancy, this time pairing s-selectional requirements with positions.

8. An interesting observation is made by Grimshaw (1990) regarding the scope of the Θ -criterion. Grimshaw suggests that it violates a more general cognitive principle barring the occurrence of certain information being simultaneously presented. Restricting the Θ -criterion to arguments misses a generalisation one would wish to make regarding the ungrammaticality of sentences containing multiple adjuncts such as **I saw him on Monday on Tuesday*, **I went to the shop to the movies*. We leave this point open.

9. See, for example, Larson (1988) for case assignment in double object constructions, and Mahajan (1990) for the assignment of case to the specifier position.

10. That case marking and Θ -marking are properties of chains rather than NPs is irrelevant to the discussion here. The arguments that we shall dwell upon apply to chains as well.

11. The LFG analysis was based on the assignment of grammatical functions to positions versus overt case markers.

12. Third person singular agreement in Turkish is non-overt.

13. The effect of negation is too complex to be apparent in the linear order of morphemes as witnessed by the interaction of this morpheme and those of modality, tense and aspect.

14. For example in Slave the subject marker is closer to the verb than the object marker (Rice 1985) but in Bantu languages (Baker 1988) the object marker is closer to the verb. In Slave the subject agreement marker precedes nominalisation but in most languages, Turkish being one, it is the converse.

15. In fact this is exactly what it seems to affect. In Kichaga (cf. Bresnan and Moshi 1990) which Alsina argues behaves just like Kinande, the symmetry of the language (i.e. that two objects in a sentence can behave alike, "double-object" properties in Baker's terms) only predicts that the object can be a patient or a beneficiary in

sequences similar to (14), and significantly, does not seem to be relevant for the difference between the interpretations. In fact, the examples provided by Bresnan and Moshi only have one single interpretation for the sequence in (14), and oddly, this is the one which is problematic, namely (14 ii). We do not have sufficient data to understand which properties are linked to others in these languages. But how the property of being a double object language ties in with there being two interpretations for a single string is certainly not as clear as Alsina implies.

16. One alternative proposal could be that *-ku* is a buffer which has to exist for phonological reasons, and does not have any semantic content. Muysken, however, argues that it does have semantic and syntactic content as a binder of the anaphor created by the reciprocal.

17. We cannot do justice to the vast amount of work generated in the recent years on this debate. The reader is referred to the introductory articles in Huck and Ojeda (1987) and Maracz and Muysken (1989) for a discussion of the issues.

18. The configurationality parameter was reinterpreted and revised by Jelinek (1984) who also worked on Warlpiri.

19. Kornfilt (1990b) also points out that reformulating the Projection Principle such that it holds at all levels in some languages but at only one level in others blurs its content.

20. Hale suggests that in non-configurational languages case assignment takes place inherently and is not linked to positions in a hierarchical configuration, but is linked to thematic positions in LS.

21. An additional problem relating to Case Theory is the presence of accusative case marking in passive sentences in some languages such as Japanese.

22. The works contributing to the configurationality debate are many. See, Kiss (1981), Horvath (1986), Brody (1990) on Hungarian, Farmer (1989), Farmer, Hale and Tsujimura (1986) on Japanese, Kornfilt (1990) on Turkish and Catsimali (1990) on Greek, among others.

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